Permit No. WA 000093-1
Issuance Date: March 23, 1990
Expiration Date: September 23, 1994

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
WASTE DISCHARGE PERMIT

State of Washington
DEPARTMENT OF ECOLOGY
Olympia, Washington 98504-8711

In compliance with the provisions of
The State of Washington Water Pollution Control Law
Chapter 90.48 Revised Code of Washington
and
The Federal Water Pollution Control Act
(The Clean Water Act)
Title 33 United States Code, Section 1251 et seq.

Kaiser Aluminum & Chemical Corporation
Tacoma Reduction Plant
3400 Taylor Way
Tacoma, Washington 98421

Plant Location	Receiving Water
3400 Taylor Way Tacoma, Washington	Hylebos and Blair Waterways Water Quality Class B
Industry Type	**Discharge Location**
Primary Aluminum Smelting, Aluminum Casting, Rolling & Drawing	Kaiser Drainage Ditch to Hylebos Waterway, and Underground Pipeline to the Blair Waterway Water Body I.D. No. WA-10-0020 Latitude 47N, 15', 46" Longitude 122W, 22', 08"

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in authorized to discharge in accordance with the special and general conditions which follow.

Richard A. Burkhalter, P.E.
Supervisor, Industrial Section
Department of Ecology

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SUMMARY OF SCHEDULED ACTIVITIES AND REPORT SUBMITTALS

1.	Submit discharge monitoring report (DMR) to the Department.	Monthly
2.	Install a precipitation gage on the industrial site	By 7/23/90
3.	Conduct salmonid bioassay per effluent limitations and submit report to the Department at the conclusion of testing.	Semiannually
4.	Update spill control plan and submit to the Department.	By 9/23/90, annual updates thereafter
5.	Update solid waste control plan and submit to the Department.	By 9/23/90, update 180 days before permit expiration
6.	Submit industrial discharge treatment system operating plan to the Department.	By 9/23/90
7a.	Submit stormwater runoff discharge sampling plan to the Department for approval.	By 9/23/90
7b.	Conduct stormwater runoff study.	Within four months of Departmental approval
7c.	Submit report on stormwater runoff study results to the Department.	Within 6 months of initiation of study
8a.	Submit a plan for wastewater discharge reduction/elimination study to the Department for review and approval.	By 6/23/90
8b.	Conduct wastewater discharge reduction/elimination study within three months.	Within one month of Departmental approval
8c.	Submit a report on the results and conclusions of the wastewater discharge reduction/elimination study to the Department.	Within two months of study completion
9a.	Submit dilution ratio study plan to the Department for approval.	Within 4 months after installation of new outfall
9b.	Conduct dilution ratio study.	Within one year after installation of new outfall

9c. Submit report on results of dilution ratio study to the Department.	Within three months of completion of study
10a. Conduct acute biomonitoring study of effluent, testing every other month for one year.	Beginning by 9/23/90
10b. Submit report on results of acute biomonitoring study of effluent to the Department.	Within two months after each sampling interval
11a. Conduct chronic biomonitoring study of effluent, quarterly testing for one year.	Within second year of permit term
11b. Submit report on results of chronic biomonitoring study of effluent to the Department.	Within two months after each sampling interval
12a. Conduct chemical analysis of influent and effluent.	Within second year of permit term
12b. Submit report on results of chemical analysis of influent and effluent to the Department.	Within four months of initial sampling
13a. Submit a comprehensive study plan for the acute biomonitoring sediment study, chemical analysis of sediment study, and benthic macroinvertebrate study to the Department.	By 9/23/91
13b. Conduct acute biomonitoring sediment study, chemical analysis of sediment study, and benthic macroinvertebrate study.	Within the third year of permit term
13c. Submit report on results of acute biomonitoring sediment study, chemical analysis of sediment study, and benthic macroinvertebrate study to the Department.	Within four months of initial sampling
14a. Conduct particulate monitoring study.	Upon written notification from the Department
14b. Submit report on results of particulate monitoring study to the Department.	Within nine months of written notification

SMELTER CONFIGURATION

On the issue date of this permit, the Permittee operates a primary aluminum smelter and associated facilities. The plant has three potlines using 400 horizontal stud Soderberg reduction cells capable of producing approximately 210 tons/day of aluminum metal. The potline air pollution control system employs dry scrubbers and therefore produces no contaminated wastewater.

BASIS OF LIMITATIONS

Since the Permittee has zero building block allowances under nonferrous metals manufacturing point source category, primary aluminum smelting subcategory, 40 CFR Part 421.20 - 421.27, the permit effluent limitations and monitoring requirements are based on best professional judgement (BPJ) for control of toxic, nonconventional, and conventional pollutants. In addition, BPJ wet and dry weather limitations are included for fluoride and total suspended solids (TSS).

WATER QUALITY STANDARD

The Permittee's discharge from outfall 001 as measured at the end-of-pipe shall not exceed the water quality criteria for marine water chronic levels, as referenced in the State Water Quality Standards, WAC 173-201.

WATER QUALITY BASED HUMAN HEALTH CRITERIA

Based on data from the Permittee's NPDES permit application and other wastewater analyses, including those performed by the Department, the Department believes that the Permittee's outfall 001 effluent fails to satisfy water quality based human health criteria (HHC) for three parameters. These include arsenic, polychlorinated biphenyls (PCB's), and polynuclear aromatic hydrocarbons (PAH's). The Department has determined not to set effluent limitations for these parameters equal to or below the HHC for the three parameters until the Total Maximum Daily Load (TMDL) and/or Waste Load Allocation (WLA) for all industrial/municipal contributors in the Commencement Bay Nearshore Tideflats area are determined. After the TMDL and/or WLA is completed and provided that it requires compliance with lower arsenic, PCB's, and PAH's limitations, the Department shall reopen the permit and incorporate these limitations. In the interim, the Department has required the Permittee's discharge to meet all applicable chronic level marine water criteria as referenced in the State Water Quality Standards, WAC 173-201.

EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

I. LIMITS AND MONITORING

A. Outfall 001: Industrial Wastewater Discharge from Settling Basin into the Kaiser Ditch leading to Hylebos Waterway

From the issuance date of this permit, the Permittee is authorized to discharge from outfall No. 001, subject to the following limitations and conditions:

Parameter	Effluent Limits Monthly Average	Effluent Limits Daily Maximum	Monitoring Requirements Frequency	Monitoring Requirements Sample Type
Total Suspended Solids (TSS)	See limitations below		Daily	24-hour Comp.
Fluoride	See limitations below		Daily	24-hour Comp.
Aluminum	16.0 lbs/day	36.0 lbs/day	Daily	24-hour Comp.
Oil & Grease		10.0 mg/l	Daily *	Grab
Benzo(a)pyrene (a)		0.01 mg/l	Weekly *	24-hour Comp.
Cyanide, Free (b)		0.001 mg/l	Weekly **	24-hour Comp.
PCBs, Total (c)		0.003 mg/l	Quarterly	Grab
Nickel		0.01 mg/l	Weekly **	24-hour Comp.
Copper (d)			Weekly **	24-hour Comp.
pH (e)	6.0 to 9.0 at all times		Continuous	Continuous
Temperature °F			Continuous	Continuous
Flow, MGD			Continuous	Continuous
Precipitation, inches as rain (f)			Daily	24-hour
Aluminum Metal Production, tons/day				Daily Average

Dry & Wet Weather TSS and Fluoride Effluent Limitations

Parameter	Monthly Average	Daily Maximum	Daily Precipitation
TSS	48.0 lbs/day	71.0 lbs/day	< 0.10 inches
Fluoride	26.0 lbs/day	52.0 lbs/day	
TSS	200.0 lbs/day	400.0 lbs/day	= or > 0.10 inches
Fluoride	100.0 lbs/day	200.0 lbs/day	

TSS and fluoride will be allowed higher discharge limitations during wet weather events. Precipitation (reported as inches of rainfall) shall be measured for the twenty-four hour period corresponding with the daily composite from outfall 001. A forty-eight (48) hour flushing out period will be granted for the system before returning to dry weather limits. For 2 or more consectutive days of rainfall greater than 0.10", the twenty-four hour flushing out period shall be applied only after the last day of significant rainfall. If the average monthly precipitation exceeds 0.10"/day, then the wet weather monthly average TSS and fluoride limitations apply.

Discharge and Monitoring Definitions and Explanations

- The monthly average is defined as the sum of all daily discharges divided by the number of daily discharges measured during the calendar month.

- The daily maximum is defined as the highest allowable daily discharge during the calendar month.

- 24-hour Composite is defined as a 24 hour flow or time proportional sample, whichever is most representative of the discharge.

- Daily monitoring is defined as seven days per week; weekly monitoring is defined as one day per week; and quarterly monitoring is defined as four days evenly spaced out per year, i.e., approximately once every ninety days.

- Production daily average is defined as the total calendar monthly production divided by the actual production days during that month.

- The following equipment shall be used during composite collection: 1) teflon or stainless steel tubing, and 2) priority pollutant-cleaned one to two gallon glass jars with teflon-lined lids. The composited sample shall be refrigerated at 4 °C in the dark during collection.

* After one year of daily oil & grease and weekly B(a)P monitoring data have been collected, the Department will review the data and modify the monitoring frequency if appropriate to ensure compliance with permit limits.

** After six months of weekly nickel, cyanide, and copper monitoring data has been collected, the Department will review the data and modify the monitoring frequency if appropriate to ensure compliance with the nickel and cyanide permit limits. If necessary, the Department may also establish limitations for copper. The copper limitations would be accomplished by permit modification.

(a) In addition to analyzing B(a)P, the Permittee shall analyze for all principal polynuclear aromatic hydrocarbons (PAH's). The Permittee shall include for Departmental submittal in addition to the Discharge Monitoring Report (DMR), a summary sheet or the actual data sheet(s) listing the appropriate PAH's and their respective concentration. The list of PAH's to analyze for and report include:

Acenaphthene, Acenaphthylene, Anthracene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(g,h,i) perylene, Benzo(k)fluoranthene, Chrysene, Dibenzo(a,h)anthracene, Fluoranthene, Fluorene, Indeno(1,2,3-cd)pyrene, Naphthalene, Phenanthrene, and Pyrene

(b) "Free" cyanide is defined as weak and dissociable cyanide. The following referenced laboratory procedure for weak and dissociable cyanide shall be used.

Weak and Dissociable Cyanide (manual distillation), Method 4500-CN I., pp. 4-38--4-39, Standard Methods for the Examination of Water and Wastewater, Seventeenth Edition, 1989, APHA, (hereafter referred to as Standard Methods).

(c) Within thirty days after the issuance date of this permit, the PCB contaminated waste stream previously discharged to the City of Tacoma sewer system shall be rerouted into the 001 industrial wastewater stream. A grab sample shall be collected from the sampling port of the oil/water separator prior to comingling with other sources of 001 wastewater. In addition, flow from the oil/water separator shall be monitored continuously and reported on a daily basis (7/week).

(d) The Permittee shall monitor for dissolved, acid-extractable, and total copper for the first six months of the permit term. Dissolved and acid-extractable copper shall be separated from total copper according to the preliminary treatment procedures (Method 3030) cited in Standard Methods. The Permittee shall analyze the separate copper fractions using either Method 3113, Metals by Electrothermal Atomic Absorption Spectrometry, Standard Methods, or EPA Method 220.2.

(e) pH limitation is 6.0 to 9.0 at all times with some excursions between 9.0 and 10.0 being allowed. Excursions between 9.0 and 10.0 shall be allowed provided no single excursion exceeds 60 minutes in length and total excursions do not exceed 7 and 26 minutes per month. Any excursion above 10.0 or below 6.0 shall be considered violations.

(f) Within four months of the permit issuance date, a precipitation gage shall be installed and monitored on the Permittee's property. The location of installation and type of rain gage selected shall be subject to Departmental approval. The monitoring frequency for the first year of the permit will be daily (7 days per week). After the first year, the Department may decrease the monitoring frequency if other daily parameters such as oil & grease, or TSS have been relaxed.

B. Outfalls 003 and 004: Stormwater Discharge into the Taylor Ditch leading to Hylebos Waterway

From the issuance date of this permit, the Permittee is authorized to discharge from outfalls No. 003 and 004 subject to the following conditions:

Parameter	Monitoring Requirements	
	Frequency	Sample Type
Aluminum	***	Grab
Total Suspended Solids	***	Grab
Fluoride	***	Grab
Oil & Grease	***	Grab
Benzo(a)pyrene (a)	***	Grab
Cyanide, Free (b)	***	Grab

*** Three samples each month during October through March and one sample each month during April through September with storm event flows. The samples shall be collected during the first two hours of heavy stormwater runoff to ensure initial flush is accounted for.

1) Only stormwater shall be discharged.

2) In the event that significant levels of pollutants are detected by periodic monitoring, the Department may 1) set effluent limits for these pollutants, or 2) have the Permittee reroute these wastestreams into industrial outfall 001. This would be accomplished by permit modification.

(a) In addition to monitoring solely for benzo(a)pyrene, the Permittee shall follow Permit Condition S1.I.A(b).

(b) The Permittee shall use the "weak and dissociable cyanide" method as referenced in Permit Condition S1.I.A(c).

C. Outfall 005: Industrial Wastewater Discharge into Pipeline leading to Blair Waterway

From the issuance date of this permit, the Permittee is authorized to discharge from outfall No. 005 subject to the following conditions:

Parameter	Monitoring Requirements	
	Frequency	Sample Type
Aluminum	Monthly	Grab
Total Suspended Solids	Monthly	Grab
Fluoride	Monthly	Grab
Oil and Grease	Monthly	Grab

1) Only noncontaminated non-contact cooling water shall be discharged.

2) In the event that significant levels of pollutants are detected by periodic monitoring, the Department may 1) set effluent limits for these pollutants, or 2) have the Permittee reroute these wastestreams into industrial outfall 001. This would be accomplished by permit modification.

II. SALMONID BIOASSAY

The Permittee's wastewater discharge at outfall 001 shall allow 80 percent survival of salmonid test fishes in a 100 percent concentration of treated effluent for a 96-hour period. These tests shall be conducted on a semi-annual basis by the Permittee using techniques conforming to protocols specified in Permit Condition S4. A portion of the bioassay sample shall be preserved (refrigerated at 4 °C in the dark) for later chemical analysis should the bioassay fail.

Whenever process or treatment changes cause a change in effluent composition, or a routine semiannual test is failed, bioassays shall be conducted once a month for three consecutive months. All three of these tests must be passed before the Permittee may revert back to the semiannual schedule. The Permittee shall notify the Department if additional testing is to be conducted.

The Department may require more frequent testing if routine monitoring shows a significant increase for any of the parameters listed in Permit Condition S1.I., Limits and Monitoring.

III. TEMPERATURE CRITERIA

The receiving water quality immediately outside the Permittee's dilution zone shall not exceed the following temperature criteria as defined in 173-201-045(c)(iv) WAC. (Note: Until the Permittee has obtained an approved dilution zone from the Department, the criteria given below shall apply toward outfall 001 end-of-pipe.

Temperature shall not exceed 19 °C (centrigrade) due to human activities. Temperature increases shall not, at any time, exceed t=16/T.

When natural conditions exceed 19 °C, no temperature increase will be allowed which will raise the receiving water temperature by greater than 0.3 °C.

For purposes hereof, "t" represents the maximum permissible temperature increase measured at a dilution zone boundary; and "T" represents the background temperature as measured at a point or points unaffected by the discharge and representative of the highest ambient water temperature in the vicinity of the discharge.

IV. DILUTION ZONE

At the issuance date of this permit, the Permittee does not have a Departmental approved dilution zone since they are discharging their effluent directly into the "Kaiser Ditch". The Department has determined that a dilution zone can not be applied toward the "Kaiser Ditch". The nearest potential water body where a dilution zone could be granted is the Hylebos Waterway. If the Permittee determines that they can meet all applicable water quality criteria, and that the installation of a culvert-pipeline directly into the Hylebos Waterway is unnecessary, then the issue of a dilution zone is moot. However, if the Permittee installs the aforementioned culvert-pipeline, the Department will then approve a dilution zone and define its boundaries at that time.

S2. MONITORING AND REPORTING

The Permittee shall monitor the parameters as specified in Permit Condition S1.I., Limits and Monitoring and shall comply with the following additional requirements:

A. Representative Sampling, Sample Collection, and Holding Time

Samples and measurements taken to meet the requirements of this permit shall be representative of the volume and nature of the discharge, and shall include representative sampling of any unusual discharge or discharge condition, including bypasses, upsets, and maintenance related conditions affecting effluent quality. A minimum of four liters of composited sample from each sample location(s) shall be made available to the Department upon unannounced and announced wastewater inspections. All collected composited sample(s) shall be stored refrigerated until 10:00 a.m. before being discarded.

B. Test Procedures

All sampling and analytical methods used to meet the monitoring requirements specified in this permit shall, unless otherwise approved in writing by the department, conform to the Guidelines Establishing Test Procedures for the Analysis of Pollutants, contained in 40 CFR Part 136.

C. Recording of Results

For each measurement or sample taken, the Permittee shall record the following information: (1) the date, place, and time of sampling; (2) the date of analysis; (3) name of analyst; (4) the technique or methods used; and (5) the results of the analysis.

D. Records Retention

The Permittee shall retain on site for a minimum of three years all records of monitoring and results, including all reports and instrument recordings. This period of retention may be extended by request of the department.

E. Reporting

Monitoring results obtained during the previous month shall be summarized and reported on the Discharge Monitoring Report (DMR) Form (EPA No. 3320-1). In addition, a summary sheet listing daily results shall be submitted to the Department. The monthly DMR and summary sheet shall be mailed to the following address no later than 15 days after the end of the month:

Department of Ecology
Industrial Section
Mail Stop PV-11
Olympia, WA 98504-8711

F. Sample Dechlorination

The Permittee shall not dechlorinate any effluent samples prior to conducting biomonitoring or bioassay tests.

G. Flow Measurement

Appropriate flow measurement devices and methods consistent with accepted scientific practices shall be selected and used to ensure the accuracy and reliability of measurements of the volume of monitored discharges. The devices shall be installed, calibrated, and maintained to insure that the accuracy of the measurements are consistent with the accepted capability of that type of device. Frequency of calibration shall be in conformance with the manufacture's recommendations or at a minimum frequency of at least one calibration per year. Devices selected shall be capable of measuring flows with a maximum deviation of less than + or - 10% from true discharge rates throughout the range of expected discharge volumes.

S3. OTHER REQUIREMENTS

The Permittee shall submit a report to the Department that interprets and summarizes the data from each study required in Permit Condition S3.

I. EFFLUENT AND WATER QUALITY MONITORING STUDIES

A. Dilution Ratio Study

Note: If the Permittee determines that they can meet all applicable water quality criteria (Permit Condition S3.I.E.) and that the installation of a culvert-pipeline directly into the Hylebos Waterway is unnecessary, the following permit condition (S3.I.A.) is not applicable.

Assuming that a culvert-pipeline (outfall 001) has been installed into the Hylebos Waterway, the Permittee shall determine the dilution ratio of effluent to receiving water at the edge of outfall 001 dilution zone. The dilution zone shall be defined using 1) Criteria for Sewage Works Design, DOE 78-5, Revised 1985, or updated versions thereof, or 2) other Departmental guidance. The dilution ratio shall be determined during normal production levels at the facility and during critical receiving water conditions approved by the Department. The dilution ratio shall be measured in the field with dye, salt, or other tracers using study protocols specified in Permit Condition S4.I.A.

A dilution ratio study plan addressing site specific elements shall be submitted to the Department within four months after installation of the new 001 outfall (culvert or pipeline into the Hylebos Waterway). The study shall be conducted within 12 months after installation of said outfall. The Permittee shall apply the dilution ratio measured in the field to existing effluent water quality data to estimate pollutant concentrations in the receiving water at the edge of the dilution zone.

The Permittee shall compare the results of the calculated pollutant concentrations (at the edge of the dilution zone) to the applicable water quality criteria at marine water chronic levels, as referenced in the State Water Quality Standards, WAC 173-201-045 and -047. A written report outlining this information shall be submitted to the Department within three months after completion of the dilution ratio study.

If the results of the dilution ratio study indicate that the concentration of any pollutant exceeds, or shows the reasonable potential to exceed, the applicable State Water Quality Standards (marine water chronic levels), the Permittee shall submit to the Department a management or treatment plan to reduce the pollutant(s) to acceptable levels. This plan shall be submitted within six months after completion of the dilution ratio study. The Department may reopen the permit to establish effluent limitations for any such pollutant.

B. Acute Biomonitoring Study (Effluent)

Acute toxicity testing of final industrial effluent (outfall 001 effluent) shall be conducted every other month for one year in accordance with protocols, monitoring requirements, and quality assurance/quality control (QA/QC) procedures specified in Permit Condition S4.I.B.

Testing shall be conducted using three organisms: 1) a salmonid indigenous to the Northwest, 2) Daphnia magna or Daphnia pulex (Daphnia pulex is recommended if hardness is < 150 mg/l as $CaCO_3$), and 3) Hyalella azteca.

The testing shall begin within six months after the issuance date of this permit. A written report of the toxicity test results and any source investigation shall be submitted to the Department within two months after each sampling interval.

During the acute biomonitoring study, the Permittee's existing permit limit for salmonid bioassays of 80 percent survival in 100 percent effluent will apply. However, passage of the 100 percent concentration of effluent in the salmonid acute biomonitoring study test shall satisfy the Permittee's 100 percent effluent permit limit requirement, i.e., passage of two fish bioassays in this study spaced six months apart in this section shall satisfy Permit Condition S3.A. of this permit for that time period only.

The Department will review the results from the first year of biomonitoring to determine which species will be used in future testing. For the remainder of the permit term, testing shall be conducted on a quarterly basis using the single species chosen, with all other requirements remaining the same.

C. Chronic Biomonitoring Study (Effluent)

Chronic toxicity testing of final industrial effluent (outfall 001 effluent) shall be conducted four times per year for one year in accordance with protocols, monitoring requirements, and QA/QC procedures specified in Permit Condition S4.I.C. The testing shall be conducted as described below.

Effluent samples for the chronic biomonitoring study and for the acute biomonitoring study shall be timed to coincide, such that all samples shall be collected simultaneously.

Testing shall be conducted on the early life stages of three organisms: 1) an Echinoderm (either the sand dollar or the sea urchin), 2) one bivalve larvae species, and 3) an organism selected by the Permittee, subject to Departmental approval.

The bivalve larvae tests shall be performed at least one week apart during the natural spawning period of the organisms. Two of the tests shall be

split samples which are also tested with an echinoderm. The initially selected bivalve shall be used for all four tests.

The echinoderm tests shall be performed at least one month apart, and shall be spaced throughout the year to the maximum extent possible. Two of the tests shall use the same echinoderm species, and shall coincide with bivalve larvae testing (above). The other two echinoderm tests may use different species if necessary due to seasonal availability of the organisms. The time frame for testing of the third chronic species shall coincide as much as possible with the testing of the other two species.

Sampling shall be conducted within the second year of the permit term. A written report of the toxicity test results shall be submitted to the Department within two months after each sampling interval.

D. Chemical Analysis of Influent and Effluent

The Permittee shall conduct chemical analyses of influent and effluent samples collected from the settling pond system in accordance with protocols, study requirements, and QA/QC procedures specified in Permit Condition S4.I.D.

Influent and effluent samples shall be analyzed for pH, conductivity, hardness, and the following pollutants of concern: 1) total cyanide and free cyanide (free and dissociable cyanide); 2) total fluoride; 3) Metals - Ag, Al, As, Be, Cd, Cr, Cu, Fe, Hg, Mn, Ni, Pb, Se, Sb, Sn, Tl, and Zn (total recoverable metals); 4) Base/Neutral/Acids (principally for four, five, and six numbered ring polyaromatic hydrocarbons (PAHs)) and pesticides; and 5) polychlorinated biphenyls (PCBs - all principal Aroclor mixtures).

Influent and effluent sampling shall be timed to coincide with one of the acute and chronic (effluent) biomonitoring intervals in the second year of the permit term, such that all samples are collected simultaneously. A written report shall be submitted to the Department within four months after initial sampling.

E. Effluent Characterization and Determination if Chronic Water Quality Criteria are Satisfied

The Permittee shall determine if outfall 001 effluent, measured at the end-of-pipe, exceeds the applicable chronic level marine water quality criteria, as referenced in the State Water Quality Standards, WAC 173-201. The Permittee shall make this determination within six months of the issuance date of this permit.

If the applicable chronic marine water quality criteria is exceeded, the Permittee shall submit to the Department a management or treatment plan to reduce the affected pollutant(s) so that chronic water quality criteria is satified. This plan shall be submitted within nine months after issuance

of this permit. Implementation of the plan, if necessary, shall commence within one year after Departmental approval of the said plan.

II. SEDIMENT MONITORING

Note: If the Permittee installs a new culvert-pipeline directly into the Hylebos Waterway and caps/fills in the "Kaiser Ditch" with clean sand, sediment or clay, the following permit conditions (S3.II.A., S3.II.B, and S3.II.C.) are not applicable.

If the Department adopts sediment quality standards applicable to the area of the Permittee's discharge, the Department may modify or establish new permit requirements consistent with those standards. This may include authorization of a sediment impact and/or sediment recovery zone.

The Permittee shall prepare a comprehensive site-specific baseline study plan addressing the requirements specified for the three studies identified in the following subsections. This plan shall be submitted within 18 months of the issuance date of this permit.

Following Departmental approval of the plan, sampling shall be conducted during March or April within the third year of the term of the permit. The studies described in subsections S3.II.A. and S3.II.B. shall be conducted simultaneously. A written report of the results of each study shall be submitted to the Department within four months of initial sampling.

If the studies demonstrate the presence of toxicity in the sediments, the Department shall detemine if there are reasonable methods available to reduce the sediment contamination and/or toxicity. If these reasonable methods exist, the Department may require the Permittee to implement these methods.

A. Acute Biomonitoring Study (Sediment)

The Permittee shall conduct an acute toxicity study of sediment in the area of industrial outfall 001 (within the Kaiser Ditch prior to discharge into the Hylebos Waterway) in accordance with protocols, study requirements, and QA/QC procedures specified in Permit Condition S4.II.A.

The organisms used in the study shall be Rhepoxynius abronius and a bivalve larvae or an Echinoderm, or another (different) species approved by the Department.

B. Chemical Analysis of the Sediment

The Permittee shall conduct chemical analyses of sediment samples collected in the area of industrial outfall 001 (within the Kaiser Ditch prior to discharge into the Hylebos Waterway) in accordance with protocols, study requirements, and QA/QC procedures specified in Permit Condition S4.II.B.

The chemical analyses shall be conducted on sediment composite samples subsampled from samples collected for the acute biomonitoring sediment study.

The samples shall be analyzed for the following pollutants of concern: 1) total cyanide and free cyanide (soluble cyanide at pH 7); 2) total fluoride; 3) Metals - Ag, Al, As, Be, Cd, Cr, Cu, Fe, Hg, Mn, Ni, Pb, Se, Sb, Sn, Tl, and Zn (total recoverable metals); 4) Base/Neutral/Acids (principally for four, five, and six numbered ring polyaromatic hydrocarbons (PAHs)) and pesticides; and 5) polychlorinated biphenyls (PCBs - all principal Aroclor mixtures). The Permittee shall also analyze for the chemical parameters in the marine Sediment Quality Standards when these standards are finalized.

C. Benthic Macroinvertebrate Abundance Study

The permittee shall conduct an abundance assessment of benthic macroinvertebrates in the area of industrial outfall 001 (within the Kaiser Ditch prior to discharge into the Hylebos Waterway) in accordance with protocols, study requirements, and QA/QC procedures specified in Permit Condition S4.II.C.

III. PARTICULATE MONITORING STUDY

The Permittee shall analyze samples of the particulate fraction of effluent from industrial outfall 001 after Departmental guidelines and protocols have been established. The Department will notify the Permittee in writing when the guidelines are established. At that time, the Permittee shall collect and analyze particulate samples for the pollutants specified by the Department, and submit the results to the Department within nine months from the date of notification.

IV. OTHER SPECIAL REQUIREMENTS

A. Spill Control Plan

The Permittee shall annually update the existing Spill Control Plan, subject to Departmental approval, for the prevention, containment, and control of spills or unplanned discharges of: 1) oil and petroleum products, and 2) materials, which when spilled, or otherwise released into the environment, are designated Dangerous (DW) or Extremely Hazardous Waste (EHW) by the procedures set forth in WAC 173-303-070.

The Spill Control Plan shall include the following:

1) A description of the reporting system which will be used to alert responsible managers and legal authorities in the event of a spill.

2) A description of preventative measures and facilities (including an overall facility plot showing drainage patterns) which prevent, contain, or treat spills of these materials.

3) A list of all oil and chemicals used, processed, or stored at the facility which may be spilled into waters of the state.

4) For purposes of this requirement, plans and manuals required by 40 CFR Part 112, and also the contingency plan and emergency procedures of WAC 173-303-350 and 360, may be included.

An updated Spill Control Plan shall be submitted for Departmental review and approval within six months of the issuance date of this permit. The Spill Control Plan and supplements shall be followed throughout the term of the permit.

B. Treatment System Operating Plan

The Permittee shall submit a Treatment System Operating Plan for the Industrial wastewater and stormwater streams(s) (outfall 001). The Permittee shall submit the plan for Departmental review and approval within six months of the issuance date of this permit. The Treatment System Operating Plan shall be followed throughout the term of the permit.

The plan shall include, but is not limited to, the following:

1) A baseline operating condition which describes the operating parameters and procedures used to meet the limits in Permit Condition S1.I.A.

2) In the event of an upset (such as high solids loading from severe stormwater events), the plan shall describe the operating procedures and conditions employed to control or mitigate the upset.

In the event of lower production levels, the Permittee shall operate the treatment system to meet its design efficiency at the lower production levels.

C. Stormwater Runoff

The Permittee shall develop a sampling program to assess pollutants in stormwater runoff discharges for outfalls 001, 003, and 004. The program shall include sampling locations and schedule(s), and pollutants of concern to be analyzed. The list of pollutants shall include, but may not be limited to, TSS, fluoride, aluminum, oil & grease, copper, arsenic, polychlorinated biphenyls (PCB's), and high molecular weight polynuclear aromatic hydrocarbons including benzo(a)pyrene. The Permittee shall distinguish those areas directly associated with industrial activities from other areas (such as parking lots). The sampling program shall be submitted to the Department for approval within six months of the issuance

date of the permit. The stormwater sampling program shall be initiated within four months of Departmental approval of the sampling program. A written report of the stormwater study results shall be submitted to the Department within six months of initiation of the study. Additional permit limits may be imposed for storm water discharges.

D. Solid Waste Disposal

1) The Permittee shall handle and dispose of all solid waste material in a manner to prevent its entry into the state ground or surface waters.

2) The Permittee shall not allow leachate from its solid waste material to enter state ground or surface waters without providing all known, available, and reasonable treatment, nor allow such leachate to cause any adverse effect on state ground or surface waters.

3) The Permittee shall submit an updated solid waste control plan within six months of issue date of this permit for Departmental review and approval. The plan shall include all wastes except those covered by Chapter 173-303 WAC (Dangerous Waste Regulations). The plan shall include a description, source, generation rate, and disposal methods for these wastes. Proposed changes in disposal practices shall be submitted to the Department for review and approval.

   The plan shall not be at variance with any approved local solid waste management plan. The Permittee shall comply with the plan as approved by the Department. The Permittee shall submit an update of the plan with the application for permit renewal 180 days prior to the expiration date of the permit.

4) If wastes subject to Chapter 173-303 WAC are generated, the plan shall include the State/EPA identification number.

E. Oil and Hazardous Substance Liability

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the Permittee from any liabilities, or penalties, to which he may be subject under Section 311 of the Federal Clean Water Act.

F. Discharge Reduction/Elimination Study

The Permittee shall conduct a wastewater/stormwater discharge reduction/elimination study. The proposed study plan shall be submitted to the Department for review and approval within three months of the issuance date of this permit. The study shall commence within one month of Departmental approval. The study shall be completed within three months after commencement of the study. A written report of the study

shall be submitted to the Department within two months after the conclusion of the study.

The study's ultimate goal is to reduce/eliminate contaminants in wastewater/stormwater discharges from this facility to state ground or surface waters. This study shall include methods of approaching/achieving a zero contaminant discharge facility. Sources of potentially contaminated wastewater shall be evaluated for flow volumes and chemical composition. These sources shall include, but not be limited to, oil/water separator water, noncontact cooling water, and stormwater runoff. Methods and alternatives shall be determined to reduce or eliminate these wastewater sources. This study shall also provide technical and economic means of evaluating wastewater reduction/elimination alternatives and the time frames for implementing these alternatives.

G. Permit Reopener

The Department may reopen this permit on the basis of monitoring results or other causes consistent with State and federal regulations, and/or to modify or establish specific monitoring requirements, effluent limitations, or other conditions in this permit.

S4. NPDES PERMIT SPECIAL CONDITIONS - PROTOCOLS, MONITORING OR STUDY REQUIREMENTS, AND QA/QC METHODS

I. EFFLUENT AND WATER QUALITY MONITORING

A. Dilution Ratio Study

1. Protocols

The Permittee shall determine the dilution ratio using protocols outlined in the following references or approved modifications thereof (or by another field method approved by the Department):

- Fischer, H.B., 1981. "Transport Models for Inland and Coastal Waters". Symposium Proceedings. Academic Press.
- Fischer, H.B. et. al., 1979. "Mixing in Inland Coastal Waters". Academic Press.
- Rutherford, J.C., 1981. Handbook on Mixing in Rivers. Water and Soil Miscellaneous Publication No. 26. New Zealand National Water and Soil Conservation Organization.

2. Study Requirements

The dilution zone study shall be determined during the most critical receiving water conditions, i.e., marine waters: salinity and tidal conditions approved by the Department.

3. The Permittee shall use some method of fixing the location of the outfall and dilution zone boundaries (e.g., triangulation off the shore, microwave navigation, theodolite system, or using Loran or Satnav coordinates) with an accuracy level of two meters.

B. Acute Biomonitoring Study

1. Protocols

The bioassays shall be conducted in accordance with the following protocols or approved modifications thereof:

- Salmonid: Biological Testing Methods, Part A, Static Acute Fish Toxicity Test, Washington State Department of Ecology 80-12, 1981 or latest revision thereof.
- Daphnia magna: Peltier, W. and C.I. Weber, Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms, (48-hour definitive test), EPA/600/4-85/013, March 1985.

- Daphnia pulex: Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms, (48-hour definitive test), EPA/600/4-85/013, March 1985.

- Hyalella azteca:
  1) Primary Reference: Nebeker, A.V., M.A. Cairns, et. al., 1984. Biological methods for determining toxicity of contaminated freshwater sediments to invertebrates. (96-hour test). Environmental Toxicology and Chemistry. V.3 (617-630).

  2) Additional Information on Effluent/Receiving Water Test: Peltier, W. and C.I. Weber. Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms, (96-hour test), EPA/600/4-85/013, March 1985.

2. Monitoring Requirements

a. Testing shall be conducted on grab or composite samples of effluent. The type of sample chosen shall be used consistently throughout the testing period.

b. A portion of each bioassay sample shall be preserved (refrigerated in the dark) for later chemical analysis should the bioassay fail.

c. All tests shall measure the response of the organisms in 0 percent (control) and 100 percent effluent concentrations. If mortality in a given test exceeds 20 percent in the 100 percent effluent concentration, the Permittee shall notify the Department and immediately resample the effluent and retest the effluent in a series of dilutions (definative test; 0, 6.25, 12.5, 25, 50, and 100 percent effluent concentrations, or another approved dilution series) to determine: 1) the LC_{50}, and 2) any statistically significant differences between the results for the control and each effluent concentration tested. The Permittee shall also investigate for any unusual conditions including spills and poor operating procedures which might have caused the toxicity.

If the definitive test demonstrates the presence of acute toxicity, the Permittee shall immediately notify the Department and undertake the following actions as needed to determine the source of toxicity:

- Chemical analyses of the effluent.

- Evaluation of treatment processes and chemicals used.

- Physical inspection of facility for proper operation of treatment units.

- Examination of records such as discharge monitoring reports, pretreatment program records, and spill reports.

- Interviews with plant personnel to determine if toxicant releases occurred through spills or unusual operating conditions.

The Permittee may be directed to take additional steps to reduce toxicity remaining after completion of the above steps. The goal of any additional measures will be to achieve reduction in toxicity within the shortest reasonable time.

d. Each written report shall include all relevant information outlined in Section 10, Report Preparation, of Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, EPA/600/4-85/014, December 1985.

3. Quality Assurance/Quality Control Procedures

All quality assurance criteria used (including the LC_{50} calculation method) shall be in accordance with Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms, EPA/600/4-85/013, and Quality Assurance Guidelines for Biological Testing, EPA/600/4-78-043, or approved modifications thereof. Test results which are not valid (e.g., control mortality exceeds acceptable level) will not be excepted and testing must be repeated.

C. Chronic Biomonitoring Study

1. Protocols

The bioassays shall be conducted in accordance with the following protocols or approved modifications thereof:

- Echinoderm (sea urchin and sand dollar): Dinnel, P.A., et. al., 1987. Improved methodology for a sea urchin sperm cell bioassay for marine waters. Archives of Environmental Contamination and Toxicology. V.16. pp. 23-32.

- Echinoderm (sea urchin): Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms, EPA/600/4-87/028, May 1988.

- Bivalve larvae (oyster and mussel): ASTM, 1986. Standard practice for conducting static acute toxicity tests with larvae of four species of bivalve mollusks. Annual Book of ASTM Standards, Water and Environmental Technology. V.11.04, pp.368-384. American Society for Testing and Materials, Philadelphia, PA.

- The protocol for the third chronic species shall be approved by the Department.

2. Monitoring Requirements

a. Testing shall be conducted on grab or composite samples of effluent. The type of sample chosen shall be used consistently throughout the testing period.

b. For discharges to marine waters, the toxicity testing shall be initially conducted with the highest percent effluent that will not cause adverse salinity effects. If a test organism is not adversely affected at that effluent concentration, no further bioassays will be required for that organism on that sample. However, if there is a detectable adverse effect (defined as a positive response by the test organism), further testing of that sample shall be required. The Permittee may use a salinity adjustment of the effluent sample to accomplish an acceptable series of effluent concentrations, if the laboratory can demonstrate successful use of salinity adjustments in bioassays to the Department.

All tests shall measure the response of the organisms in a series of dilutions (0, 6.25, 12.5, 25, 50, and 100 percent effluent concentrations, or another approved dilution series) to determine if the "No Observed Effect Concentration" (NOEC - the highest continuous concentration of effluent that will not cause an observable adverse effect on the test organisms at the 95% confidence level) exists at either, whichever is applicable, the end-of-pipe, or at the edge of the dilution zone determined from the Permittee's dilution ratio study (Permit Condition S3.I.A.).

c. Each written report submitted to the Department shall indentify the most sensitive species and specify the NOEC and LC50, and shall include all relevant information outlined in Section 10, Report Preparation, of Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, EPA/600/4-85/014, December 1985 (or to Marine and Estuarine Organisms, EPA/600/4-87/028, May 1988).

d. The Department will provide direction to the Permittee if toxicity exceeding or threatening water quality is detected in the effluent. This direction will address reducing or eliminating toxicity to acceptable levels within the shortest reasonable time.

3. Quality Assurance/Quality Control Procedures

The Permittee shall follow the quality assurance procedures discussed in the protocols cited in this section (Permit Condition S4.I.C.), or approved modifications thereof. Test results which are not considered valid (i.e., excessive control mortality, or inadequate control responses) will not be accepted by the Department and the test(s) shall be repeated.

D. Chemical Analysis of Influent and Effluent

1. Protocols

Sample analysis shall be conducted in accordance with 40 CFR 136 and/or Standard Methods for the Examination of Water and Wastewater, Seventeenth Edition, 1989, APHA.

2. Monitoring Requirements

a. The following samples shall be collected for analyses: 1) influent to the settling pond system (first pond of the pond system) - two samples, with sampling times at least one week apart; and 2) effluent from the final pond (001 pond) immediately prior to the present 001 monitoring station - two samples, collected at such times that results, in conjunction with influent analyses results, may be used to estimate constituent removal efficiencies across the settling pond system. In addition, a tracer study shall be performed to determine the hydraulic retention time within the pond system.

b. Each sample of the influent and effluent shall be a representative composite consisting of continuous sampling or six grab samples equally spaced over a 24-hour period.

3. Quality Assurance/Quality Control Procedures

The Permittee shall follow the quality assurance procedures in 40 CFR 136 and/or Standard Methods for the Examination of Water and Wastewater, Seventeenth Edition, 1989, APHA.

II. SEDIMENT MONITORING

A. Acute Biomonitoring Study

1. Protocols

The study shall be conducted in accordance with the following protocols or approved modifications thereof:

- Discharges to marine waters: Puget Sound Protocols, Final Report, TC-3991-04, Prepared for U.S. Environmental Protection Agency - Puget Sound Estuary Program, Tetra Tech Inc., March 1986.

2. Definitions for Sediment Samples

a. "ambient": sediment sample representative of the immediate ambient conditions of the receiving water sediments, including adverse sediment effects from other human activities.

b. "control": sediment sample which is physically and chemically characteristic of the area from which the test animals were collected (e.g., native sediment).

c. "reference": sediment sample which serves as a lab indicator of the test animal's tolerance to non-anthropogenic sediment physical and chemical variables (e.g., grain size, and organic carbon content) similar to those found in the test sediment sample.

3. Study Requirements

a. The Permittee shall collect five samples at equally spaced distances along the length of the Kaiser Ditch on the North side of Taylor Way. The Permittee shall also collect five samples for use as a background (ambient). The ambient samples shall be collected in the Hylebos Waterway above the discharge point of the Kaiser Ditch. The sampling area used for the background shall exhibit similar physical and chemical characteristics as measured in the Kaiser Ditch, i.e., 1) similar salinity, pH, and temperature in the overlying water column, and 2) similar grain size, organic carbon material present, and percentage of fines within the sediment itself.

b. The Permittee shall use some method of fixing the location of the sample collection (i.e., triangulation off the shore, microwave navigation, theodolite system, or using Loran or Satnav coordinates) with an accuracy level of two meters.

c. The sediment collected for samples shall consist of a representative (and homogenized) sample of the biologically active zone, as specified in the Permittee's study plan. The minimum depth of sampler penetration shall exceed the depth of collected sample sediment by two centimeters.

d. All sediment samples shall be split in half. One half of each sample shall be preserved for later chemical analysis should the bioassay fail. The other halves shall be composited into one sample each for the five ditch samples and for the five ambient samples. Each of the two composite samples (the ditch composite and the ambient composite) shall then be subsampled, for use in the acute bioassay study and in the chemical analysis study.

e. The study shall measure any significant difference in survival and sublethal effects of the test species using the reference sediment sample.

4. Quality Assurance/Quality Reference Procedures

a. The Permittee shall follow the quality assurance procedures discussed in the protocols cited in this section (Permit Condition S4.II.A.1.).

b. Reference samples with similar characteristics (e.g., grain size and organic carbon content) and lab control samples shall be used for quality control. The Permittee shall document in their report when and where the reference sample was collected, and what analyses were conducted. Chemical analysis of the sediment reference samples may also be required.

B. Chemical Analysis of the Sediment

1. Protocols

a. Sediment sampling shall be conducted in accordance with the sampling requirements specified in Permit Condition S4.II.A.3.

b. Sediment monitoring shall be conducted in accordance with the protocols (or approved modifications thereof) included in the document, Puget Sound Protocols, Final Report, TC-3991-04, Prepared for U.S. Environmental Protection Agency - Puget Sound Estuary Program, Tetra Tech Inc., March 1986. Detection levels must be in the low parts-per-billion range (1-50 ug/kg) for semi-volatiles, as referenced in Table 2 of the Organic Compounds section in the Puget Sound Protocols.

2. Monitoring Requirements

In addition to analyzing for specified toxic pollutants, the Permittee shall analyze the sediment samples for grain size, total organic carbon (TOC), oil and grease, ammonia, total sulfides and other parameters needed to evaluate the sediment chemistry data.

3. Quality Assurance/Quality Control Procedures

The Permittee shall follow the quality assurance procedures discussed in the protocols cited in this section (Permit Condition S4.II.B.1.).

C. Benthic Macroinvertebrate Abundance Study

1. Protocols

The study shall be conducted in accordance with Departmental guidelines and protocols, when they have been established. In their absence, the study shall be conducted in accordance with the following protocols or approved modifications thereof:

- Puget Sound Ambient Monitoring Program Final Report, April 1988, Puget Sound Water Quality Authority - Benthic Macroinvertebrate Abundances Section.

- "Recommended Protocols for Sampling and Analyzing Subtidal Benthic Macroinvertebrate Assemblages in Puget Sound", Final Report,

January 1987. In: Puget Sound Protocols, Puget Sound Estuary Program.

- "Recommended Protocols for Station Positioning in Puget Sound", Final Report, August 1986. In: Puget Sound Protocols, Puget Sound Estuary Program.

- Standard Methods for the Examination of Water and Wastewater, Seventeenth Edition, 1989, APHA.

2. Study Requirements

a. The Permittee shall collect five samples at equally spaced distances and at similar depths along the length of the Kaiser Ditch on the North side of Taylor Way. The Permittee shall also collect five samples again at similar depths for use as a background (ambient). The ambient samples shall be collected in the Hylebos Waterway above the discharge point of the Kaiser Ditch. The sampling area used for the background shall exhibit similar physical and chemical characteristics as measured in the Kaiser Ditch, i.e., 1) similar salinity, pH, and temperature in the overlying water column, and 2) similar grain size, organic carbon material present, and percentage of fines within the sediment itself.

b. The Permittee shall use some method of fixing the location of the sample collection (e.g., triangulation off the shore, microwave navigation, theodolite system, or using Loran or Satnav coordinates) with an accuracy level of two meters.

c. Sediment samples collected for the benthic macroinvertebrate abundance study shall not be split from samples collected for any other study.

d. The minimum depth of sediment collected for samples shall be representative of the biologically active zone, as specified in the Permittee's study plan.

e. Each sample shall be sieved on a 1.0 mm screen, and at a minimum, all retained organisms shall be identified to family level and enumerated prior to grouping into major taxonomic groups (Annelida, Mollusca, Arthropoda, Echinodermata, and miscellaneous). Statistical analysis using the Student T Test will be performed on the abundance of the major taxonomic groups, in comparison to the reference samples.

3. Quality Assurance/Quality Control Procedures

The Permittee shall follow the quality assurance procedures discussed in the protocols cited in this section (Permit Condition S4.11.C.1.).

GENERAL CONDITIONS

G1. Discharge Violations

All discharge and activities authorized by this permit shall be consistent with the terms and conditions of this permit. The discharge of any pollutant more frequently than, or at a concentration in excess of, that authorized by this permit shall constitute a violation of the terms and conditions of this permit.

G2. Proper Operation and Maintenance

The Permittee shall at all times properly operate and maintain all facilities and systems of collection, treatment, and control (and related appurtenances) which are installed or used by the Permittee for pollution control.

G3. Reduced Production for Compliance

The Permittee, in order to maintain compliance with its permit, shall control production and/or all discharges upon reduction, loss, failure, or bypass of the treatment facility until the facility is restored or and alternative method of treatment is provided. This requirement applies in the situation where, among other things, the primary source of power of the treatment facility is reduced, lost, or fails.

G4. Noncompliance Notification

If for any reason, the Permittee does not comply with, or will be unable to comply with, any of the discharge limitations or other conditions specified in the permit, the Permittee shall, at a minimum, provide the Department with the following information:

a. A description of the nature and cause of noncompliance, including the quantity and quality of any unauthorized waste discharges;

b. The period of noncompliance, including exact dates and times and/or the anticipated time when the Permittee will return to compliance; and

c. The steps taken, or to be taken, to reduce, eliminate, and prevent recurrence of the noncompliance.

In addition, the Permittee shall take immediate action to stop, contain, and clean up any unauthorized discharges and take all reasonable steps to minimize any adverse impacts to waters of the state and correct the problem. The Permittee shall notify the Department by telephone so that an investigation can be made to evaluate any resulting impacts and the corrective actions taken to determine if additional action should be taken.

In the case of any discharge subject to any applicable toxic pollutant effluent standard under Section 307(a) of the Clean Water Act, or which could constitute a threat to human health, welfare, or the environment, 40 CFR Part 122 requires that the information specified in items G4.a., G4.b., and G4.c., above, shall be provided not later than 24 hours from the time the Permittee becomes aware of the circumstances. If this information is provided orally, a written submission covering these points shall be provided within five days of the time the Permittee becomes aware of the circumstances, unless the Department waives or extends this requirement on a case-by-case basis.

Compliance with these requirements does not relieve the Permittee from responsibility to maintain continuous compliance with the conditions of this permit or the resulting liability for failure to comply.

G5. Bypass Prohibited

The intentional bypass of wastes from all or any portion of a treatment works is prohibited unless the following four conditions are met:

a. Bypass is: 1) unavoidable to prevent loss of life, personal injury, or severe property damage; or 2) necessary to perform construction or maintenance-related activities essential to meet the requirements of the Clean Water Act and authorized by administrative order;

b. There are no feasible alternatives to bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes. maintenance during normal periods of equipment down time, or temporary reduction of termination of production;

c. The Permittee submits notice of an unanticipated bypass to the Department in accordance with Condition G.4.. Where the Permittee knows or should have known in advance of the need for a bypass, this prior notification shall be submitted for approval to the Department, if possible, at least 30 days before the date of bypass (or longer if specified in the special conditions);

d. The bypass is allowed under conditions determined to be necessary by the Department to minimize any adverse effects. The public shall be notified and given an opportunity to comment on bypass incidents of significant duration, to the extent feasible.

"Severe property damage" means substantial physical damage to property, damage to the treatment facilities which would cause them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

After consideration of the factors above and the adverse effects of the proposed bypass, the Department will approve or deny the request. Approval of a request to bypass will be by administrative order under RCW 90.48.120.

G6. Right of Entry

The Permittee shall allow an authorized representative of the Department, upon the presentation of credentials and such other documents as may be required by law:

a. To enter upon the premises where a discharge is located or where any records must be kept under the terms and conditions of this permit;

b. To have access to and copy at reasonable times any records that must be kept under the terms of the permit;

c. To inspect at reasonable times any monitoring equipment or method of monitoring required in the permit;

d. To inspect at reasonable times any collection, treatment, pollution management, or discharge facilities; and

e. To sample at reasonable times any discharge of pollutants.

G7. Permit Modifications

The Permittee shall submit a new application or supplement to the previous application where facility expansions, production increases, or process modifications will 1) result in new or substantially increased discharges of pollutants or a change in the nature of the discharge of pollutants, or 2) violates the terms and conditions of this permit.

G8. Permit Modified or Revoked

After notice and opportunity for public hearing, this permit may be modified, terminated, or revoked during its term for cause as follows:

a. Violation of any terms or conditions of the permit;

b. Failure of the Permittee to disclose fully all relevant facts or misrepresentations of any relevent facts by the Permittee during the permit issuance process;

c. A change in any condition that requires either a temporary or a permanent reduction or elimination of any discharge controlled by the permit;

d. Information indicating that the permitted discharge poses a threat to human health or welfare;

e. A change in ownership or control of the source; or

f. Other causes listed in 40 CFR Part 122.62 and 122.63.

Permit modification, revocation and reissuance, or termination may be initiated by the Department or requested by any interested person.

G9. Reporting a Cause for Modification

A Permittee who knows or has reason to believe that any activity has occurred or will occur which would constitute cause for modification or revocation and reissuance under condition G8. or 40 CFR Part 122.62 must report such plans, or such information, to the Department so that a decision can be made on whether action to modify or revoke and reissue a permit will be required. The Department may then require submission of a new application. Submission of such application does not relieve the discharger of the duty to comply with the existing permit until it is modified or reissued.

G10. Toxic Pollutants

If any applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is established under Section 307(a) of the Clean Water Act for a toxic pollutant and that standard or prohibition is more stringent than any limitation upon such pollutant in the permit, the Department shall institute proceedings to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition.

G11. Plan Review Required

Prior to constructing or modifying any waste water control facilities, detailed plans shall be submitted to the Department for approval in accordance with Chapter 173-240 WAC. Facilities shall be constructed and operated in accordance with the approved plan.

G12. Other Requirements of 40 CFR

All other requirements of 40 CFR Part 122.41 and 122.42 except 122.41(n) are incorporated in this permit by reference.

G13. Compliance With Other Laws and Statutes

Nothing in this permit shall be construed as excusing the Permittee from compliance with any applicable federal, state, or local statutes, regulations, or ordinances.

G14. Additional Monitoring

The Department may establish specific monitoring requirements in addition to those contained in this permit by administrative order or permit modification.

G15. Revocation for Non-Payment of Fees

The Department may revoke this permit if the permit fees established under Chapter 173-224 WAC are not paid.

G16. Removed Substances

Collected screenings, grit, solids, sludges, filter backwash, or other pollutants removed in the course of treatment of wastewaters or control of wastewaters shall not be resuspended or reintroduced to the final effluent stream for discharge to state waters.

G17. Duty to Reapply

The Permittee must reapply for a permit at least 180 days before the expiration date of this permit.

G18. Permit Reopener

The Department may reopen this permit, on the basis of monitoring results or other causes consistent with State and Federal regulations, to modify or establish specific monitoring requirements, effluent limitations, or other conditions in the permit.

1990

CHRISTINE O. GREGOIRE
Director

STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

7272 Cleanwater Lane, LU-11 • Olympia, Washington 98504-6811 • (206) 753-2353

November 19, 1990

Mr. John A. Leskovar, Chief Engineer
Kaiser Aluminum
3400 Taylor Way
Tacoma, Washington 98421

Dear Mr. Leskovar:

This letter is to inform you that the period for development of a consent order regarding Port of Tacoma, Terminal 7 Ore off-loading, has been extended to December 12, 1990.

Based on the complexity of this multi-party site and the progress made by the parties, an extension of twenty days has been granted by the Department of Ecology.

I hope the final details will be resolved at our next scheduled meeting on December 6, 1990.

Sincerely,

for Kevin Goodbout
Urban Bay Supervisor

KG:MH:gar

Issue Date: August 1, 1984
Modification Date: February 5, 1986
Expiration Date: August 1, 1989

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
WASTE DISCHARGE PERMIT

State of Washington
DEPARTMENT OF ECOLOGY
Olympia, Washington 98504

In compliance with the provisions of
Chapter 90.48 RCW as amended
and
The Clean Water Act as amended
Public Law 95-217

Kaiser Aluminum & Chemical Corporation
Tacoma Reduction Plant
3400 Taylor Way
Tacoma, Washington 98421

Plant Location	Receiving Water
Tacoma, Washington	Hylebos Waterway
Industry Type	**Discharge Location**
Primary Aluminum Smelting	Taylor Way Drainage Ditch

The above-named corporation is authorized to discharge at the locations described in accordance with the conditions contained herein.

Marc Horton
Deputy Director
Department of Ecology

SMELTER CONFIGURATION

On the issue date of this permit, the permittee operates a primary aluminum smelter and associated facilities. The plant has three potlines using the horizontal stud soderberg process and one potline using the centerwork prebake process, which produce approximately 210 tons/day of aluminum metal.

The air pollution control system employs the dry scrubbing technique and therefore produces no contaminated waste water.

BASIS OF LIMITATIONS

The effluent limitations of this permit are based upon best available technology (BAT) guidelines published in 40 CFR part 421, and best conventional technology (BCT) limitations developed by using best practicable technology and best engineering judgment.

Best conventional treatment guidelines have not been promulgated by EPA. When they become available, this permit may be modified to include new limitations for appropriate pollutants.

PERMIT MODIFICATIONS

This permit is modified due to revisions of the plant waste water system, the elimination of the wet cathode reprocessing, and the finding that the continuous rod casting operation was noncontact. Provisions have been added for other storm water discharges, and a storm water outfall modification requirement. A discharge limitation and monitoring requirement for Benzo(a)pyrene has been added as an indicator pollutant for potential sludge hydrocarbon discharges. Other permit limitations and conditions remain unchanged.

SPECIAL CONDITIONS

S1. EFFLUENT LIMITATIONS

a. From the modification date of this permit, the permittee is authorized to discharge from the outfall No. 001, subject to the following limits:

Parameter	Daily Average	Daily Max.
Total Suspended Solids	200 lb/day	400 lb/day
Fluoride	100 lb/day	200 lb/day
Oil and Grease	-	10 mg/l
Benzo(a)pyrene		.01 mg/l
pH	6.0 to 9.0*	

* - Indicates the range of permitted values, all excursions outside this range shall be considered violations (i.e., 40 CFR 401.17 shall not apply to this discharge).

The daily average is the average of daily values obtained over a month's time.

The daily maximum is defined as the greatest value for any one day.

b. From the modification date of this permit, the permittee is authorized to discharge from outfalls No. 002, 003, 004, and 005 subject to the following conditions and limitations:

1. Only noncontaminated cooling water and storm water shall be discharged.

2. These outfalls shall be monitored for the pollutants and at the frequency indicated in paragraph S2. of this permit.

3. In the event that significant levels of pollutants are detected by periodic monitoring, the department may set effluent limits for these pollutants by permit modification or regulatory order.

S2. DISCHARGE MODIFICATIONS

The storm waters currently discharged from outfall 002 for area B3 shall be discontinued, and these waters diverted to the settling pond and outfall 001. Storm waters from area B2 shall be tested for fluorides to determine if these waters should also be diverted. These modifications, as approved by the department, shall be accomplished on or before January 1, 1987.

Areas B2 and B3 are as described in the plot plan included with permit application WAD 001882984.

S3. MONITORING AND REPORTING REQUIREMENTS

a. The permittee shall monitor the discharge to outfall No. 001 according to the following requirements:

Parameter	Frequency	Sample Type
Total Suspended Solids	Daily (5 per week)	24-hr Composite
Fluoride	Daily (5 per week)	24-hr Composite
Oil and Grease	Daily (5 per week)	Grab
Benzo(a)pyrene	Monthly and **	24-hr Composite
pH	Continuous	Continuous
Flow	Continuous	Continuous

** Three samples each month during October through March.

b. The permittee shall monitor the storm water discharge to outfalls No. 002, 003, and 004, according to the following requirements:

Parameter	Frequency	Sample Type
Fluoride	***	Grab
Benzo(a)pyrene	***	Grab

*** Three samples each month during October through March with storm event flows.

c. Test Procedures

All sampling and analytical methods used to meet the above requirements shall, unless approved otherwise in writing by the department, conform to the Guide-lines Establishing Testing Procedures for the Analysis of Pol-lutants, contained in 40 CFR, Part 136, as published in the Federal Register, of December 1, 1976, or later revisions thereof, that reference the following publications:

1. American Public Health Association, Standard Methods for the Examination of Water and Wastewater.

2. American Society for Testing and Materials, A.S.T.M. Standard, Part 31, Water Analysis.

3. Environmental Protection Agency, Methods for Chemical Analysis of Water and Wastes.

d. Representative Samples

Samples and measures taken to meet the requirements of this permit shall be representative of the volume and nature of the discharge.

e. Recording of Results

For each measurement or sample taken, the permittee shall record the following information: (1) date, time, and place of sampling; (2) date of analysis; (3) name of analyst; (4) analytical technique or method used; and (5) the results of analysis.

f. Records Retention

The permittee shall retain for a minimum of three years all records of monitoring and results, including all reports and instrument recordings. This period of retention may be extended by request of the department.

g. Reporting

Monitoring results obtained during the previous month shall be reported on forms provided by the department, on or before the 15th day of the following month. The discharge monitoring reporting forms shall be sent to:

Department of Ecology
Industrial Section
Mail Stop PV-11
Olympia, Washington 98504

S3. SOLID WASTES

a. The permittee shall handle and dispose of all solid waste materials in a manner to prevent its entry into the ground or surface waters of the state.

b. The permittee shall not permit leachate from its solid waste material to enter state waters without providing all known, available, and reasonable treatment, nor allow such leachate to cause any adverse effect on state ground and surface waters. The permittee shall apply for a permit or permit modification as may be required for such discharges.

c. The permittee shall submit a solid waste control plan within six months of the issue date of this permit for review and approval of the department. The plan shall include all wastes except those covered by Chapter 173-303 WAC (Dangerous Waste Regulation). The plan shall include a description, source,

generation rate, and disposal methods for these wastes. Any changes in disposal practices shall be submitted for department review and approval.

d. If wastes subject to Chapter 173-303 WAC are generated, the plan shall include the state/EPA identification number.

S4. OTHER REQUIREMENTS

a. Salmonoid Bioassays

Wastewater discharged from outfall No. 001 shall allow 80 percent survival for a 96-hour period of any salmonoid test fishes in a 65 percent concentration. These tests shall be conducted by the permittee using bioassay procedures approved by the Department of Ecology.

Tests shall be performed annually. Whenever process or treatment changes cause a change in effluent composition, bioassays shall be conducted for three consecutive months and pass the test prior to reverting to the annual schedule. In the event that effluent limitations are exceeded, the department may require additional tests.

b. Spill Prevention, Containment, and Countermeasure Plan

The permittee shall create and maintain a plan, subject to department approval, for the prevention, containment, and control of spills or unplanned discharges of oil or hazardous substances. The plan shall include the following:

1. A description of the reporting system which will be used to alert responsible managers and legal authorities.

2. A description of the preventing measures and facilities (include an overall facility plot) which prevent, contain, or treat spills of these materials.

3. A list of all oil and hazardous substances used, processed, or stored at the facility which may be spilled into permitted discharges.

4. A facility plot showing all surface drainage routes.

5. For purposes of this requirement, plans and manuals required by the following may be included:

   (a) CFR Title 33, Chapter I, subpart O, Part 154, dated December 21, 1971, or as amended.

   (b) CFR Title 40, Chapter I, subchapter D, Part 112, dated December 11, 1973.

Within six months of the issue date of this permit, the permittee shall subject an updated Spill Prevention, Containment, and Countermeasure Plan for department review and approval.

c. Oil and Hazardous Substance Liability

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any liabilities, or penalties, to which he may be subject under Section 311 of the Federal Clean Water Act.

GENERAL CONDITIONS

G1. All discharges and activities authorized by this permit shall be consistent with the terms and conditions of this permit. The discharge of any pollutant more frequently than, or at a level in excess of, that authorized by this permit shall constitute a violation of the terms and conditions of this permit.

G2. The permittee shall at all times properly operate and maintain all facilities and systems of collection, treatment, and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the terms and conditions of this permit.

G3. The permittee, in order to maintain compliance with its permit, shall control production and/or all discharges upon reduction, loss, failure, or bypass of the treatment facility until the facility is restored or an alternative method of treatment is provided. This requirement applies in the situation where, among other things, the primary source of power of the treatment facility is reduced, lost, or fails.

G4. If, for any reason, the permittee does not comply with, or will be unable to comply with, any of the discharge limitations or other conditions specified in the permit, the permittee shall, at a minimum, provide the department with the following information:

a. A description of the nature and cause of noncompliance, including the quantity and quality of any unauthorized waste discharges;

b. The period of noncompliance, including exact dates and times and/or the anticipated time when the permittee will return to compliance; and

c. Steps taken, or to be taken, to reduce, eliminate, and prevent recurrence of the noncompliance.

In addition, the permittee shall take immediate action to stop, contain, and clean up any unauthorized discharges and take all reasonable steps to minimize any adverse impacts to waters of the state and correct the problem. The permittee shall notify the department immediately by telephone so that an investigation can be made to evaluate any resulting impacts and the corrective actions taken to determine if additional action should be taken.

In the case of any discharge subject to any applicable toxic pollutant effluent standard under Section 307(a) of the Clean Water Act, or which could constitute a threat to human health, welfare, or the environment, 40 CFR Part 122 requires that the information specified in items G4.a., G4.b., and G4.c., above, shall be provided not later than 24 hours from the time the permittee becomes aware of the circumstances. If this information is provided orally, a written sub-

mission covering these points shall be provided within five days of the time the permittee becomes aware of the circumstances, unless the department waives or extends this requirement on a case-by-case basis.

Compliance with these requirements does not relieve the permittee from responsibility to maintain continuous compliance with the conditions of this permit or the resulting liability for failure to comply.

G5. The intentional bypass of wastes from all or any portion of a treatment works to the extent that permit effluent limitations cannot be met is prohibited unless the following four conditions are met:

a. Bypass is: (1) unavoidable to prevent loss of life, personal injury, or severe property damage; or (2) necessary to perform construction or maintenance-related activities essential to meet the requirements of the Clean Water Act and authorized by administrative order;

b. There are no feasible alternatives to bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, maintenance during normal periods of equipment down time, or temporary reduction or termination of production;

c. The permittee submits notice of an unanticipated bypass to the department in accordance with Condition G4. Where the permittee knows or should have known in advance of the need for a bypass, this prior notification shall be submitted for approval to the department, if possible, at least 30 days before the date of bypass (or longer if specified in the special conditions);

d. The bypass is allowed under conditions determined to be necessary by the department to minimize any adverse effects. The public shall be notified and given an opportunity to comment on bypass incidents of significant duration, to the extent feasible.

"Severe property damage" means substantial physical damage to property, damage to the treatment facilities which would cause them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

After consideration of the factors above and the adverse effects of the proposed bypass, the department will approve or deny the request. Approval of a request to bypass will be by administrative order under RCW 90.48.120.

G6. The permittee shall allow an authorized representative of the department, upon the presentation of credentials and such other documents as may be required by law:

a. To enter upon the premises where a discharge is located or where any records must be kept under the terms and conditions of this permit;

b. To have access to and copy at reasonable times any records that must be kept under the terms of the permit;

c. To inspect at reasonable times any monitoring equipment or method of monitoring required in the permit;

d. To inspect at reasonable times any collection, treatment, or discharge facilities; and

e. To sample at reasonable times any discharge of pollutants.

G7. The permittee shall submit a new application or supplement to the previous application where facility expansions, production increases, or process modifications will (1) result in new or substantially increased discharges of pollutants or a change in the nature of the discharge of pollutants, or (2) violates the terms and conditions of this permit.

G8. After notice and opportunity for public hearing, this permit may be modified, terminated, or revoked during its term for cause as follows:

a. Violation of any terms or conditions of the permit;

b. Failure of the permittee to disclose fully all relevant facts or misrepresentations of any relevant facts by the permittee during the permit issuance process;

c. A change in any condition that requires either a temporary or a permanent reduction or elimination of any discharge controlled by the permit;

d. Information indicating that the permitted discharge poses a threat to human health or welfare;

e. A change in ownership or control of the source; or

f. Other causes listed in 40 CFR Part 122.62 and 122.63.

Permit modification, revocation and reissuance, or termination may be initiated by the department or requested by any interested person.

G9. A permittee who knows or has reason to believe that any activity has occurred or will occur which would constitute cause for modification or revocation and reissuance under condition G8. or 40 CFR Part 122.62 must report such plans, or such information, to the department so that a decision can be made on whether action to modify or revoke and reissue a permit will be required. The department may then require submission of a new application. Submission of such application does not relieve the discharger of the duty to comply with the existing permit until it is modified or reissued.

G10. If any applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is established under Section 307(a) of the Clean Water Act for a toxic pollutant and that standard or prohibition is more stringent than any limitation upon such pollutant in the permit, the department shall institute proceedings to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition.

G11. Prior to constructing or modifying any waste water control facilities, detailed plans shall be submitted to the department for approval in accordance with Chapter 173-240 WAC. Facilities shall be constructed and operated in accordance with the approved plan.

G12. All other requirements of 40 CFR Part 122.41 and 122.42 are incorporated into this permit by reference.

G13. Nothing in this permit shall be construed as excusing the permittee from compliance with any applicable federal, state, or local statutes, ordinances, or regulations.

G14. The department may establish specific monitoring requirements in addition to those contained in this permit by administrative order or permit modification.

CONFIDENTIAL

HYLEBOS WATERWAY

ALLOCATOR'S FINAL COST ALLOCATION FORMULA REPORT

May 22, 2000

TLI SYSTEMS INCORPORATED

Technical · Legal Information Systems

small bay. Therefore, we have assumed some potential for releases from the shoreline area and we have assumed that the surface water runoff that flows to the Hylebos may have been impacted by the petroleum-contaminated soils.

Surface soils from upland areas on the west side of the site contained bis(2-ethylhexyl)phthalate (BEP) exceeding the SQO. We have assumed some potential for release via storm water runoff. We note that BEP has been detected in intertidal sediments in the embayment area surrounding the open channel ditch along the property. The source of the BEP contamination is unknown. The chemical is used as a plasticizer for polyvinyl chloride and other polymers, as a replacement for PCBs in dielectric fluids for electrical capacitors, and may also be a by-product of plants and animals. It is widely distributed in the environment as a result of its use as a plasticizer.

Department of Ecology sampling of surface water runoff in 1991 indicated elevated levels of metals and PCBs. PCBs have been detected in shoreline area soils. One surface sample contained PCBs at 300 ppb while SQO exceedances were found in two test pits on the east and west sides of the bay at 431 ppb and 1110 ppb. Based on a review of records of all locomotives received, Joseph Simon and Sons believes that there were no PCBs in any of the capacitors.

Joseph Simon and Sons, in cooperation with the Department of Ecology, completed investigations at the site and developed a plan for remediation. An Agreed Order for removal of approximately 7,900 cubic yards of soils contaminated with arsenic, copper, lead, mercury, zinc, petroleum hydrocarbons and PCBs has been issued for comment.

We have attributed modest releases of metals and PAHs from the Rail & Locomotive Operations. The source of PCBs at this site is not definitively known. The evidence in the record would seem to discount Rail & Locomotive as a source of PCBs, but the possibility does exist that some of the electrical equipment in cars and locomotives handled by Rail contained PCBs. In addition, during the time of Joseph Simon & Sons ownership of the parcel, PCBs apparently have had the potential to migrate from the site. Thus, we have attributed the possibility of PCB contribution to Joseph Simon & Sons.

Kaiser Aluminum has owned and operated an aluminum reduction plant on parcel 30 for 45 years (assuming about 6 years during which the plant was not operational). This parcel does not have waterfront access but wastewater from the parcel has been discharged to the Hylebos via a ditch from the property. Permanente Metals ("Permanente"), a corporate predecessor of Kaiser, took possession of the aluminum reduction plant and property in January 1947.

Kaiser also is associated with parcels 29 and 32. With the exception of landfilling of inert materials, such as brick and concrete, Kaiser did not conduct operations on parcel 29. There is some indication that spent potlining was stored on this site. However, regardless of whether potlining was stored here, at the time it was stored, the waterway had not been extended to its present location. It is unlikely that runoff from any potlining area would have resulted in the current sediment contamination

Aluminum production utilized an electrolytic cell containing a fluorinated compound of sodium and aluminum cryolite. The cell consists of a steel shell lined with inert, insulating materials and an electrically conductive bottom made of carbon paste. Anode and cathode pastes are made on-site at the Paste Plant by mixing 25% coal tar pitch with 75% petroleum coke. Potlining consists of a steel shell, thermal insulation, carbon lining (calcined anthracite coal and coal tar pitch), steel collector bars, and silicon carbide brick walls. When the molten bath and metal has destroyed the integrity of the potlining, the pot is taken out of service and the lining is removed and replaced. The material removed is referred to as "spent potlining." When the current flows through the cell, alumina is split into metallic aluminum, which spreads over the cell bottom, and oxygen, which evolves at the anode. Fluoride gasses, particulate matter, and pitch fumes (PAHs) also evolve from the cell and are captured in a scrubber.

Prior to restarting of the plant in 1947, wet scrubbers were installed to control fumes from the potrooms. The scrubbers originally discharged to a slough tributary to the Hylebos. In 1951, Kaiser installed settling ponds that were directed to Hylebos Creek via a ditch. Kaiser began lime treatment of the scrubber effluent in addition to settling in 1957. Scrubber effluent was handled in this manner from 1957 until the plant closed in 1958 and when the plant reopened in 1964 until 1974. In 1974, the operation began using dry scrubbers and the wet scrubber discharge to the ponds ceased.

While the facility was operated as Plancor 245, pot skimmings were reprocessed to retrieve valuable cryolite and recycled back into the process. Failed potliners were generally put in the kiln for disposal. Kaiser indicates that spent potlining, containing approximately 33% carbon, was disposed on site between the time the facility opened[43] until it was shut down in 1958. Between 1958 and 1964, the disposed potlining was removed to off-site facilities. Potlining continued to be taken off site after the facility reopened in 1964 and until 1978. .

Cooling water from various[44] sources also has been directed to the settling ponds.

Oil storage facilities located on site included a 10,000-gallon fuel oil UST, a 275-gallon and a 500-gallon diesel ASTs, a 15,000-gallon water-oil cooling agent, and about 15 55-gallon drums of lube oil.

Stormwater runoff from the potlining facility was high in cyanide. It likely soaked into the ground or flowed into storm drains until 1958, when the storm sewers were blocked to prevent migration of cyanide. Blocking the sewers caused a "lake" to form on the property. In 1958, Kaiser constructed a batch treatment plant for treating spent potlining runoff with sodium hypochlorite. From 1966 to 1984, treated runoff either was directed to the settling ponds and then the Hylebos via the "Kaiser" ditch or was directed to the City storm sewer in Taylor Way and then to the Hylebos. From October 1984 to 1986, the wastewater was directed to the ponds. In 1986, Kaiser began dry removal and storage of spent potlining and the discharge ceased.

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[43] The spent potlining management facility closure report (c. 1986) states that SPL had been stored outside since 1943. See KAI391674.

[44] Cooling water sources have included the power substation, the rectifier, the casting facility, and the rod mill.

In 1987, Kaiser indicated that PAHs, cyanide, nickel, and PCBs were pollutants known to be present in its manufacturing activity or generated as a by-product. Trichloroethene was suspected to be present.

Pathways

Nearly all discharges from the plant, including most of the stormwater discharges, have been routed through settling lagoons, and later, settling ponds, and then to the "Kaiser" ditch.

Scrubber water usage increased from 1,800 gpm to 3,400 gpm when Potline IV was constructed in 1968.

Until the early 1960s when the waterway was extended, the "Kaiser" ditch discharged to Hylebos Creek. The creek entered the waterway near the lower turning basin. In 1960, the turning basin was dredged during the extension of the Waterway.

A 1969 diagram depicts drainage from the lab area flowing to the city storm sewer in Taylor Way. The sewer appears to flow in the direction of the "Kaiser" ditch and is assumed to ultimately discharge to the Hylebos via the ditch. This discharge appears to correspond to the present Outfall 003.

Since approximately 1969, drainage from around the Rod Mill facility on the southeast corner of the property has flowed south and east and eventually to the Hylebos Creek. This discharge appears to correspond to the present Outfall 004.

Investigation Costs Impact

PAHs. PAHs are present in several segments of the aluminum plant's operations. Anode and cathode pastes are made on-site at the Paste Plant by mixing 25% coal tar pitch with 75% petroleum coke. Potlining consists of a steel shell, thermal insulation, carbon lining (calcined anthracite coal and coal tar pitch), steel collector bars, and silicon carbide brick walls. Gasses, particulate matter, and pitch fumes (PAHs) evolve from the electrolytic cells and, between 1947 and 1974, were captured in the scrubber.

Scrubber Sludge

The scrubbers originally discharged to a slough tributary to the Hylebos. In 1951, Kaiser installed settling ponds that were directed to Hylebos Creek via a ditch. Kaiser began lime treatment of the scrubber effluent in addition to settling in 1957. Scrubber effluent was handled in this manner from 1957 until the plant closed in 1958 and when the plant reopened in 1964 until 1974. Scrubber water usage increased from 1,800 gpm to 3,400 gpm when Potline IV was constructed in 1968. In 1974, the operation began using dry scrubbers and the wet scrubber discharge to the ponds ceased.

A 1957 letter from Kaiser to the PCC states that the flow out of the settling pond was about 600-700 gpm. At least 90% of suspended solids and at least 70% of tars and oils were removed in the pond. This implies that the pond discharge contained some tars and oils.

Kaiser dredged the settling lagoons in 1969 and 1971 and possibly around 1955. Dredge spoils were disposed adjacent to the lagoons. During the dredging episodes, some sludge may have been released to the ditch and subsequently to the Waterway.

In the early 1990s, sediments in the "Kaiser" ditch were found to have PAH concentrations between 13.5 ppm and 205.9 ppm. These contaminated sediments were to be removed as part of the Consent Decree.

Documents vary in their indications of the amount of PAHs contained in scrubber sludge. A concentration of less than one percent PAH compounds in the sludge is referenced in the 1990 consent decree for the sludge cleanup. However, this concentration refers only to the four- to six-ring compounds. Other estimates of PAH concentrations range from one to five percent.

Between 1950 and 1974, as much as 82,000 cubic yards of solids were generated and were still on site in 1989. In 1984, the storm drainage system was modified to better isolate the sludge area and sludges were consolidated to reduce the size of the disposal area. In the 1980's, the sludge was located in three areas in a total area of 475,000 square feet (11 acres).

Spent Potlining

Kaiser indicates that spent potlining, containing approximately 33% carbon, was disposed on site between the time the facility opened[45] until it was shut down in 1958. Between 1958 and 1964, the disposed potlining was removed to off-site facilities. Potlining continued to be taken off site after the facility reopened in 1964 and until 1978. Stormwater runoff from the potlining facility was high in cyanide. It likely soaked into the ground or flowed into storm drains until 1958, when the storm sewers were blocked to prevent migration of cyanide. In 1958, Kaiser constructed a batch treatment plant for treating spent potlining runoff with sodium hypochlorite. From 1966 to 1984, treated runoff either was directed to the settling ponds and then the Hylebos via the "Kaiser" ditch or was directed to the City storm sewer in Taylor Way and then to the Hylebos. From October 1984 to 1986, the wastewater was directed to the ponds. In 1986, Kaiser began dry removal and storage of spent potlining and the discharge ceased.

The area in back of the lab building was used for temporary storage of spent potlining before 1958. Some buried SPL may have sunk into the ground and been covered with fill. A 1969 diagram depicts drainage from the lab area flowing to the city storm sewer in

[45] The spent potlining management facility closure report (c. 1986) states that SPL had been stored outside since 1943. See KAI391674.

Taylor Way. The sewer appears to flow in the direction of the "Kaiser" ditch and is assumed to ultimately discharge to the Hylebos via the ditch. This discharge appears to correspond to the present Outfall 003.

Miscellaneous

Circa 1956, Kaiser was using waste oils and sludges for dust and vegetation control on roads and in transformer yards. Two diesel and one gasoline UST were installed when the plant was built in 1942. One of the diesel tanks was removed in 1978 and the remaining tanks were removed in 1986. Oil storage facilities currently located on site include a 10,000-gallon fuel oil UST, a 275-gallon and a 500-gallon diesel ASTs, a 15,000-gallon water-oil cooling agent, and about 15 55-gallon drums of lube oil.

Other sources of PAH-contamination include pitch spills, waste paste, air control media, and duct dust. In the past, most PAH wastes were stored with spent potlining. Prior to the 1980s when the HEAF filters were installed, a wet scrubber was used to reduce emissions from the paste plant. Water from the wet scrubber was discharged to an oil / water separator and then discharged to the storm drain, which flowed to the ponds.

Coolant consisting of 15% water-soluble oil and water is used in the rod mill. From 1969 to 1972, spent coolant was discharged to the soil in back of the rod mill. Since approximately 1969, drainage from around the Rod Mill has flowed south and east and eventually to the Hylebos Creek. This discharge appears to correspond to the present Outfall 004. In October 1969, PCC personnel traced a "silvery looking oil" from a drainage ditch at the eastern end of Taylor Way to a "drainage ditch from the most Southeast building of Kaiser Aluminum." Apparently, the paved area at the head of the ditch had recently been washed down. Based on the description, it appears the building may have been the rod mill.

In 1990, Outfall 001 was sandbagged to prevent wastewater from fighting a coal tar pitch railcar fire from reaching the Hylebos.

PAHs may have been discharged to the Hylebos via surface water runoff or process water (scrubber water) discharge to the waterway. The shallow groundwater aquifer at the site flows towards the Hylebos and the Blair. A 1987 groundwater study indicated there was no evidence that PAHs were moving in groundwater.

PCBs: Some electrical transformers currently located on site contain PCBs. The Ederer's Crane, a hydraulic crane used on Potline 3, contained 100% PCB fluid. With the exception of a spill in 1986, only incidental leaks have occurred and have been contained and prevented from migrating off site. In 1988, Kaiser disposed of 29 tons of PCB-contaminated soil debris.

In 1986, about 2900 gallons of PCB-contaminated transformer oil was released to the soil in the transformer yard. Much of the oil was recovered by basement sumps and an oil / water separator. There was no evidence that PCBs from the spill entered the Hylebos.

We have attributed to Kaiser appreciable releases of elevated concentrations of PAHs. We have assumed, based on sampling results at Kaiser's Outfall 001, that it is a possible source of PCBs, phenols, and metals.

Kaiser's RM and SQO scores takes into account the fact that significant PAH releases did not occur subsequent to the installation of dry scrubbers in 1974 and in light of the fact that releases of PCBs, phenols and metals are not believed to be significant.

Kalama Chemical, a second round cash-out party, owned and operated Sound Refining, a petroleum refinery, on parcels 58 and 59 for 5 years.

Since 1967, the wastewater treatment system has discharged to the Hylebos Waterway. Contaminants of concern associated with activities on the parcel that could have potentially been released to the Hylebos Waterway include metals, PAHs, phenols, and organics. The potential release of metals may be associated with the reported use of Asarco slag as fill along the northern length of the marine dock in late-1975/early-1976. Metals have also been detected in the process effluent.

Kalama is one of three owner/operators of this facility. The impacts of the operations from these parties can be distinguished based on their respective production volumes, discharge volumes and the loadings of oil and grease discharged pursuant to permit limitations. Based on the evidence in the record, as supplemented during oral arguments, it appears that the following can be concluded:

Under Kewanee Chemical, the oil and grease discharge limit was 50 mg/l and concentrations in discharges are assumed to be 20-30 mg/l on volume of about 120,000 to 130,000 gallons per day. During Kalama's ownership, an improved wastewater treatment plant was installed, the permit limitation was reduced to 15 mg/l, and concentrations averaged 10-12 mg/l on volume of about 70,000 gallons per day. Under Crysen, an air floatation system was added in 1991 to allow the plant to meet a 5 mg/l oil and grease limitation on average discharge volumes of about 50,000-60,000 gallons per day. Crysen operated the facility an average of 140 days a year compared to about 200 days for Kalama.

These contaminants have also been released as a result of spills from operations. During the early 1970s, the Department of Ecology noted a constant oil spill from the bank along the property. The spill was attributed to a leak in a production line.

Organic contaminants associated with petroleum compounds have been detected in site surface soils, in the crude oil and gasoline storage areas, and in groundwater. These contaminants would migrate to the Hylebos via surface water and groundwater flow.

PAHs and phenols have also been detected in the process effluent. The discharge in 1995 contained approximately 10 or 11 parts per million phenol. Pentachlorophenol, which was historically used in the process for slime and algae control, has been detected at relatively large concentrations.

S. F. No. 8574—5-55—2M. 41901.

STATE OF WASHINGTON
POLLUTION CONTROL COMMISSION
OLYMPIA, WASHINGTON

Permit T 160

In accordance with Chapter 71, Laws of 1955,
A WASTE DISCHARGE PERMIT is issued to:

Kaiser Aluminum & Chemical Corp.
3100 Taylor Way
Tacoma, Washington

Date of issue November 15, 1956

Date of expiration June 1, 1957
Extended to June 1, 1958
ATN

Waste not to exceed ~~1,100,000~~ gallons per day may be discharged to Hylebos Creek Waterway, subject to the following conditions:

1. The word "waste" in the above statement refers to the total volume of cooling and contaminated waters to be discharged.

2. During the effective period of this permit, the following changes are to be made:

   A. Effective measures are to be taken to retain the suspended solids in the settling pond, and the clarified water is to be reused insofar as is possible.

   B. Such treatment facilities as have been approved by this Commission shall be continuously and efficiently operated to produce an effluent having:

   A pH range between 6.5 and 8.5;
   Less than 150 parts per million of Fluorides content
   Less than 15 parts per million of suspended solids
   Less than 10 parts per million of oils, tars and/or pitch compounds

   C. An evaluation of existing waste disposal methods together with proposed methods for pH adjustment, are to be submitted to this Commission prior to ~~March 1, 1957~~ January 1, 1958.

3. All Requirements and ordinances of the City, regarding the installation, construction and maintenance of septic tanks, are here by made a condition of this permit.

4. Commencing January 1, 1957, a report of effluent analysis is to be submitted each month. This report is to indicate the following weekly average effluent characteristics: pH, fluorides, suspended solids, and tars and oils and the volume of wastes discharged.

(Continued on reverse side)

This permit does not allow the discharge of wastes other than those mentioned herein. A new application shall be submitted whenever a change in the waste to be discharged is anticipated.

This permit is subject to termination if the Commission finds: (1) That it was procured by misrepresentation of any material fact or by lack of full disclosure in the application; (2) That there has been a violation of the conditions thereof; (3) That a material change in quantity or type of waste disposal exists.

In the event that a material change in the conditions of the state waters utilized creates a dangerous degree of pollution, the Commission may specify additional conditions to this permit.

ATN:abc

Signed: [signature]
Director, Pollution Control Commission

This permit does not in any way release the permittee from liability for damage to persons or property caused by or resulting from the discharge of waste.

5. In the event you are temporarily unable to comply withany of the above conditions of this permit, due to break down of equipment or other cause you are to immediately notify this Commission. Your report is to include pertinent information as to the cause and what steps are being taken to correct the problem and prevent its recurrence.

JWA J.H.

Mr. J. L. Harper
District Engineer
State of Washington
Pollution Control Commission
409 Public Health Building
Olympia, Washington

Transmitted is the monthly report on our effluent water samples taken in the creek adjacent to the settling pond at our #2 pH Control Station.

Average Weekly Reading:

Specified	Actual Weekly				Monthly Average
	1	2	3	4	March 1965
pH 6.0 to 8.0	6.9	6.3	6.0	6.7	6.5
Fluoride Less Than 150 ppm	130	20	52	14	54
Suspended Solids Less Than 15 ppm	21	25	15	10	18
Oil & Tars Less Than 10 ppm	21	23	10	5	15
Cyanide Less Than 0.1 ppm*	.08	.04	.03	0	.04

Comments:

*Cyanide sampling is taken daily and analyzed weekly. All other samples are weekly and reported for each four (4) week period.

Very truly yours,

G. R. Brieger

GRB:jc

cc: P. J. O'Donnell
R. D. Finch

G. R. Brieger
Chief Chemist
Kaiser Aluminum & Chemical Corporation
3400 Taylor Way
Tacoma, Washington

J.H.
JCH
JCK

RECEIVED
MAR 1 1965
POLLUTION CONTROL COMMISSION

Mr. J. L. Harper
District Engineer
State of Washington
Pollution Control Commission
409 Public Health Building
Olympia, Washington

Transmitted is the monthly report on our effluent water samples taken in the creek adjacent to the settling pond at our #2 pH Control Station.

Average Weekly Reading:

Specified	Actual Weekly				Monthly Average
	1	2	3	4	February 1965
pH 6.0 to 8.0	7.5	7.7	7.5	7.3	7.5
Fluoride Less Than 150 ppm	16	61	95	125	74
Suspended Solids Less Than 15 ppm	36	125	3	50	53
Oil & Tars Less Than 10 ppm	6	91	35	14	36
Cyanide Less Than 0.1 ppm*	.050	.038	.036	.074	.050

Comments:

*Cyanide sampling is taken daily and analyzed weekly. All other samples are weekly and reported for each four (4) week period.

Very truly yours,

G. R. Brieger
Chief Chemist
Kaiser Aluminum & Chemical Corporation
3400 Taylor Way
Tacoma, Washington

GRB:jc

cc: P. J. O'Donnell
R. D. Finch

KAISER ALUMINUM & CHEMICAL CORPORATION

TACOMA WORKS, 3400 TAYLOR WAY, TACOMA 2, WASHINGTON

March 24, 1958

Alfred T. Neale, Acting Director
Washington State Pollution Control Commission
224 Old Capitol Building
Olympia, Washington

Dear Mr. Neale,

Tests of waste-water during February 1958 in reference to pH, F, Suspended Solids, Tars and Oils are reported as follows:

1. Pond Outlet (average results)
   pH = 3.4 (range 3.3-3.5)
   F = 96.9 ppm (range 87-108)
   Sus. Solids = 2.5 ppm (range 0-10)
   Oils & Tars = 36 ppm (range 30-48)

2. Property Effluent (average results)
   pH = 6.5 (range 6-6.5)
   F = 22.7 ppm (range 11-34)
   Sus. Solids = 51.4 ppm (range 26-60)
   Oils & Tars = 40 ppm (range 38-44)

Waste-water flow is in the order of 600-700 gpm.

Yours very truly,

KAISER ALUMINUM & CHEMICAL CORP.

John Rosene

John Rosene
Air & Water Control Coordinator

JR:rj

KAISER ALUMINUM & CHEMICAL CORPORATION

TACOMA WORKS, 6400 TAYLOR WAY, TACOMA 2, WASHINGTON

February 14, 1958

Mr. Alfred T. Neale
Washington State Pollution Control Commission
224 Old Capitol Building
Olympia, Washington

Dear Mr. Neale,

Tests of waste water during January 1958 in reference to pH, F, Suspended Solids, Tars and Oils are reported as follows:

1. Pond Outlet (average results)
   - pH = 3.4 (range 3.0-3.8)
   - F = 80.6 ppm (range 70-93)
   - Sus. Solids = 7.0 ppm (range trace-18)
   - Oils & Tars = 44.3 ppm (range trace-176)

2. Property Effluent (average results)
   - pH = 6.0 (range 6.0-6.4)
   - F = 26.5 ppm (range 11-49)
   - Sus. Solids = 50.5 ppm (range 2-110)
   - Oils & Tars = 35.4 ppm (range trace-96)

Waste-water flow rate remains in the order of 600-700 gallons per minute.

Yours very truly,

KAISER ALUMINUM & CHEMICAL CORP.

John Rosene
Air and Water Control Coordinator

JR:rj

DIR	CH E	A E	D F	SUR	INSP	1 2 3 4 5
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					FILE: CIT. (IND)	

KAISER ALUMINUM & CHEMICAL CORPORATION

TACOMA WORKS, 3400 TAYLOR WAY, TACOMA 2, WASHINGTON

January 14, 1958

RECEIVED
JAN 15 1958
Pollution Control Commission

Mr. Alfred T. Neale
Washington State Pollution Control Commission
224 Old Capitol Building
Olympia, Washington

Dear Mr. Neale,

Tests of waste water during December 1957 in reference to pH, F, Suspended Solids, Tars and Oils are reported as follows:

1. Pond Outlet (average results)
   - pH = 4.8 (range 3.5-7.4)
   - F = 62.4 ppm (range 44-84)
   - Sus. Solids = 12.5 ppm (range 4-21)
   - Oils & Tars = 14.7 ppm (range 4-32)

2. Property Effluent (average results)
   - pH = 6.3 (range 6-7)
   - F = 18.7 ppm (range 7-26)
   - Sus. Solids = 80.1 ppm (range 18-212)
   - Oils & Tars = 38 ppm (range 12-68)

Waste-water flow rate remains in the order of 600-700 gallons per minute.

Yours very truly,

KAISER ALUMINUM & CHEMICAL CORP.

John Rosene

John Rosene
Air and Water Control Coordinator

JR:rj

DIR	CH E	A E	D E	SUP	INSP	1 2 3 4 STAFF
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KAISER ALUMINUM & CHEMICAL CORPORATION

TACOMA WORKS, 3400 TAYLOR WAY, TACOMA 2, WASHINGTON

December 23, 1957

Mr. Alfred T. Neale, Acting Director
Washington State Pollution Control Commission
Old Capitol Building
Olympia, Washington

Ref. Analysis Report for Waste Water
Permit #T-160

Dear Mr. Neale:

Tests of waste water during May, June, July, and November 1957 in reference to pH, F, suspended solids, oils and tars are reported as follows:

May:

(1) Pond Outlet

pH	= 3.1 (range 2.9 - 3.4)
F	= 92.3 ppm (range 81 - 105)
Sus. Solids	= trace only (not measurable)
Oils and Tars	= 86 ppm (range 64-102)

(2) Property Effluent

pH	= 3.3 (range 3.0 - 3.9)
F	= 44.5 ppm (range 31 - 64)
Sus. Solids	= 86.7 ppm (range 67-114)
Oils and Tars	= 47.5 ppm (range 42-56)

June:

(1) Pond Outlet

pH	= 3.2 (range 2.9 - 3.4)
F	= 96.3 ppm (range 90 - 102)
Sus. Solids	= trace only (not measurable)
Oils and Tars	= 94 ppm (range 90 - 102)

(2) Property Effluent

pH	= 5.7 (range 4.2 - 6.7)
F	= 21.2 ppm (range 16-45)
Sus. Solids	= 91.5 ppm (range 44 - 160)
Oils and Tars	= 58.9 ppm (range 36 - 100)

July:

(1) Pond Outlet

pH	= 3.1 (range 3.0 - 3.2)
F	= 120.5 (range 97 - 129)
Sus. Solids	= 8.5 ppm (range 4 - 14)
Oils and Tars	= 192 ppm (range 120 - 240)

(2) Property Effluent

pH	= 3.4 (range 3.2 - 3.4)
F	= 91.5 ppm (range 77 - 97)
Sus. Solids	= 11.5 ppm (range 4 - 22)
Oils and Tars	= 69 ppm (range 52 - 100)

November:

(1) Pond Outlet

pH	= 3.4 (range 3.2 - 3.7)
F	= 84.8 ppm (range 75 - 127)
Sus. Solids	= 9.4 ppm (range 4 - 32)
Oils and Tars	= 81.7 ppm (range 12 - 284)

(2) Property Effluent

pH	= 4.8 (3.5 - 6.4)
F	= 50.8 ppm (range 23 - 93)
Sus. Solids	= 48 ppm (range 22 - 82)
Oils and Tars	= 130 ppm (range 44 - 280)

Waste water flow rate from the settling pond remains as reported earlier, that is, 600-700 gpm.

No analysis was submitted for August, September, or October due to temporarily increased analysis work for operation within the aluminum plant, and vacation times. However, samples for November at the pond outlet were about doubled in number to examine the variance possibilities between results. Actually, variance of results is not discernible, nor significant, when compared to other monthly results which have been reported.

We are preparing methods of continuous monitoring of water conditions, simultaneously, at the pond outlet (reported above) and property effluent (property line) point. Shortly, a continuous recording of water conditions will be available for inspection for both the pond outlet and property effluent point.

Yours very truly,

Kaiser Aluminum & Chemical Corporation

John Rosene
Air and Water Control Coordinator

JR:ct

KAISER ALUMINUM & CHEMICAL CORPORATION

TACOMA WORKS, 3400 TAYLOR WAY, TACOMA 2, WASHINGTON

April 24, 1957

Mr. A. T. Neale, Associate Engineer
Washington State Pollution Control Commission
224 Old Capitol Building
Olympia, Washington

Ref: Report for Waste-Water Permit T-160

Dear Mr. Neale,

Tests of waste-water during March 1957 in reference to pH, F. Suspended Solids, Tars and Oils are reported as follows:

1. Pond Outlet: (Average Results)
   pH = 3.5 (range 3.4-3.7)
   F = 83.7 ppm (range 60-104)
   Sus. Solids = 27 ppm (range 0-74)
   Oils & Tars = 68 ppm (range 0-140)

2. Property Effluent Point: (Average Results)
   pH = 6.5 (range 6.3-6.6)
   F = 23 (range 9-34)
   Sus. Solids = 45.5 (range 6-160)
   Oils & Tars = 55 (range 20-80)

Again, refer to sketch attached to our February 7 correspondence for location of sample points.

Waste-water volume which flows out of the settling-pond remains approximately in the order of 600-700 gpm to our knowledge. This is on the basis of actual metering of at least 390-400 gpm of water with the remainder estimated on the basis of pressure differentials.

We have made an evaluation of the efficiency of the existing settling-pond as a waste-disposal method in respect to suspended solids, tars and oils, and pH. Percent removal, being the easiest notation of evaluation, was determined by securing analysis of input-wastes and output-wastes. It is found that percent removal and adjustments are in the following order of magnitude:

Percent Removal of Suspended Solids: 90% (plus)
" " " Oils and Tars : 70% (plus)
pH Adjustment: 2.9 to 3.5, and upward to 5.6

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You will note that we have included in our regular monthly report a set of conditions for a property-effluent point. This represents the same series of analysis as the pond-outlet sample. The property-effluent point exists in the drainage-ditch at a point approximately 200-300 feet downstream of the pond-outlet. It is interesting to note the sharp upswing of pH from 3.5 at the pond outlet to 6.5-7.1 at the property-effluent point.

The property-effluent sample has always been taken during an out tide condition in Hylebos Creek. At this time, tide-gates open on Hylebos-Creek-Dike and allow drainage-water to enter the creek and thence flow by way of the creek-channel to the Hylebos Waterway.

A pH adjustment to a range of 6.5 to 8.5 of the pond-outlet itself will require a considerable amount of change to our present mode of waste-treatment. Basically, we have decided that this is solved only be addition of lime (CaO or CaOH) at the inlet to the pond. However, lime cannot be added in an uncontrolled manner unless we could allow swings to high pH's on pond-outlet and return water to the plant. We know that these conditions are just as detrimental as extreme low pH conditions and not allowable.

We are still making a study of the best method of possible pH adjustment of our pond outlet. You will receive a rather complete and detailed analysis in the near future.

Yours very truly,

KAISER ALUMINUM & CHEMICAL CORP.

John Rosene, Engineer,
Air Control Coordinator

JR:rj

KAISER ALUMINUM & CHEMICAL CORPORATION

TACOMA WORKS, 3400 TAYLOR WAY, TACOMA 2, WASHINGTON

February 7, 1957

Mr. E. F. Eldridge, Director
Washington State Pollution Control Commission
Olympia, Washington

Dear Mr. Eldridge:

Tests of waste-water during January 1957 in reference to pH, F, Suspended Solids, Tars and Oils are reported as follows:

1. Pond Outlet: (average results)
   - pH = 4.0 (range 3.7-4.2)
   - F = 60 ppm (range 9-130)
   - Sus. Solids = 7 ppm (trace to 20)
   - Tars and Oils = 109 ppm (trace to 308)

2. Property Effluent: (average results)
   - pH = 6.1 (range 6.0-6.3)
   - F = 58 ppm (range 30-105)
   - Sus. Solids = 32 ppm (range 8-62)
   - Tars and Oils = 174 ppm (range 132-240) — ?

In reference to suspended solids, it is normally expected that this feature should increase as the stream approaches Commencement Bay because of water-turbulence and soil-types which compose the stream-beds.

Please refer to the attached sketch which explains the location of sample points on the plantsite.

We will report more analysis in the near future in accordance with our Temporary Permit.

Yours very truly,

KAISER ALUMINUM & CHEMICAL CORP.

John Rosene

John Rosene
Air Control Coordinator

JR:rj

Information check
For Action
Permit
Other

INTER-OFFICE MEMORANDUM
Pollution Control Commission

TO: Files DATE: Feb. 16, 1959

FROM: C. V. Gibbs SUBJECT: Kaiser Aluminum & Chemical Corp.
Tacoma, Wash.

I called Mr. Joseph Dobie, Plant Supervisor, relative to the fish kill in the Hylebos Waterway on Feb. 14th and told him that Kaiser was a suspect since we found measurable quantities of cyanide in a sewer draining their property.

His reaction was that since the facilities for treating the pot liner leachings have been operated whenever necessary to prevent overflow from the leach pit, Kaiser shouldn't be accused.

I suggested that there must be some unknown connection between the leach pit and the storm sewer system. He accepted this as a possibility and agreed to check into it.

They want to co-operate in any way possible and asked if we would share samples taken from their sewers in the future so they could have them analyzed at the Mead plant.

CHARLES V. GIBBS
POLLUTION CONTROL ENGINEER
DISTRICT II

CVG:dn

DIR	CH E	A E	D E	SUR	INSP	1 2 3 4 5 STAFF
ANS	ACTION	INV	COM	INFO		FILE CITY IND COU GEN

Albert D. Rosellini
Governor

224 Old Capitol Building
Olympia, Washington

March 21, 1957

Kaiser Aluminum and Chemical Corporation
3100 Taylor Way
Tacoma 2, Washington

Gentlemen:

Investigation by the Pollution Control Commission into causes for the extensive herring fish kills in the Hylebos waterway have shown that wastes in the drain ditch below the Kaiser Aluminum Plant in Tacoma are toxic to fish. It has been found, further, that drainage water in the ditch below the plant is more toxic than the lagoon effluent.

It appears that this condition results from the discharge at high tide of the caustic lagooned wastes into an old lagoon area in which solid waste materials have been dumped. Then on the ebb tide, the discharge from the old lagoon area is drained into the ditch, thence to the Hylebos waterway.

It is therefore, required that immediate steps as follows be taken to eliminate this condition:

1. Close dike between drain ditch and old lagoon to prevent scrubbing waters from backing up into that area.

2. Neutralize the wastes in the old lagoon area by the addition of lime.

3. Notify this office when completed so that another test of conditions may be made.

4. Proceed immediately to provide for the neutralization of scrubbing waters before discharge to the lagoon.

It is understood that repair of the flume leading from the plant to the new lagoon has been completed and does not now leak into the ditch.

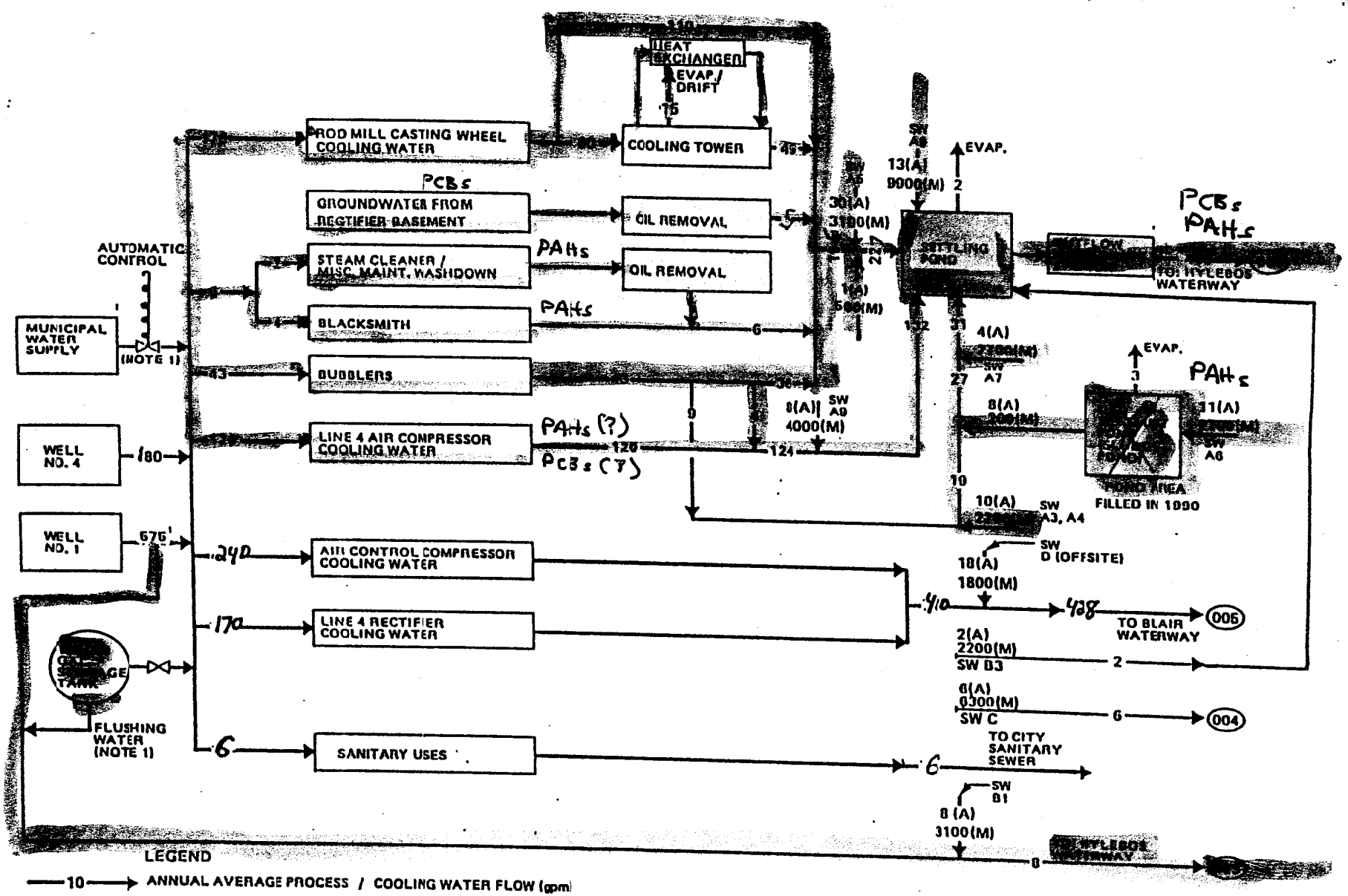
Any further steps that might be taken to help in this situation will be appreciated.

Very truly yours,

E. F. Eldridge
Director and Chief Engineer

EFE:pj

CC: Mr. Earl Coe
Department of Fisheries
City Engineer, Tacoma
Mr. John Rosene



NOTE: WATER STORAGE TANK IS FLUSHED WITH MUNICIPAL SUPPLY ONCE PER MONTH.

SCHEMATIC OF WATER FLOW

KAISER ALUMINUM AND CHEMICAL CORPORATION
TACOMA WORKS FACILITY
CITY OF TACOMA, PIERCE COUNTY, WASHINGTON

Revised 3/22/94

ease print or type in the unshaded areas only. WADO01662964

FORM 2C NPDES

U.S. ENVIRONMENTAL PROTECTION AGENCY
APPLICATION FOR PERMIT TO DISCHARGE WASTEWATER
EXISTING MANUFACTURING, COMMERCIAL, MINING AND SILVICULTURAL OPERATIONS
Consolidated Permits Program

I. OUTFALL LOCATION

For each outfall, list the latitude and longitude of its location to the nearest 15 seconds and the name of the receiving water.

A. OUTFALL NUMBER (list)	B. LATITUDE			C. LONGITUDE			D. RECEIVING WATER (name)
	1. DEG.	2. MIN.	3. SEC.	1. DEG.	2. MIN.	3. SEC.	
001	47	15	46	122	22	12	Hylebos Waterway
003	47	15	37	122	21	56	Hylebos Waterway
004	47	15	33	122	21	50	Hylebos Waterway
005	47	15	30	122	22	24	Blair Waterway

II. FLOWS, SOURCES OF POLLUTION, AND TREATMENT TECHNOLOGIES

A. Attach a line drawing showing the water flow through the facility. Indicate sources of intake water, operations contributing wastewater to the effluent, and treatment units labeled to correspond to the more detailed descriptions in Item B. Construct a water balance on the line drawing by showing average flows between intakes, operations, treatment units, and outfalls. If a water balance cannot be determined *(e.g., for certain mining activities)*, provide a pictorial description of the nature and amount of any sources of water and any collection or treatment measures.

B. For each outfall, provide a description of: (1) All operations contributing wastewater to the effluent, including process wastewater, sanitary wastewater, cooling water, and storm water runoff; (2) The average flow contributed by each operation; and (3) The treatment received by the wastewater. Continue on additional sheets if necessary.

1. OUTFALL NO. (list)	2. OPERATION(S) CONTRIBUTING FLOW		3. TREATMENT		
	a. OPERATION (list)	b. AVERAGE FLOW (include units)	a. DESCRIPTION	b. LIST CODES FROM TABLE 2C-1	
001	Noncntact Cooling Water				
	- Rod Mill	170 gpm			
	- Line 4 Air Compressors	120 gpm			
	Bubblers	43 gpm			
	Steam Cleaning/Maintenance	2 gpm	Oil Separation/Removal	1-H	
	Blacksmith	4 gpm			
	Groundwater from Rectifier		Oil Separation/Removal	1-H	
	Basement	5 gpm			
	Stormwater/Runoff				
	(Areas A3-A9 & B3)	79 gpm			
	-- Evaporation	-20 gpm			
	TOTAL	403 gpm (0.58 mgd)	Settling Basin	1-U	
003	Stormwater/Runoff (Area B1)	8 gpm			
004	Stormwater/Runoff (Area C)	6 gpm			
005	Non-contact Cooling Water				
	- Air Control Compressors	240 gpm			
	- Line 4 Rectifiers	170 gpm			
	TOTAL	410 gpm (409	gpm measured on 2/1/93 by Parametrix)		

OFFICIAL USE ONLY *(effluent guidelines sub-categories)*

CONTINUE ON REVERSE

KAISER ALUMINUM

KAISER ALUMINUM & CHEMICAL CORPORATION

April 21, 1986

Cheryl Saylor
Chem-Security Systems, Inc.
Star Route
Arlington, OR 97812

Dear Cheryl:

Some of the gravel in our rectifier yard is contaminated with low levels of PCB's. With the assistance of Landau Associates, Inc., we are in the process of developing an overall plan for area cleanup, however, this plan has not been completed. One transformer, VR-2A, was removed for service in early March and it was decided to replace the gravel under it. The attached scope of work was prepared and the contaminated gravel was to be handled as follows:

- Remove contaminated gravel and put it into dump boxes.

- Dump contaminated gravel into a truck from Secured Resources Transport, Inc. and manifest it to Arlington as code X002/W001 (waste profile sheet # E42986).

While I was gone, a small contractor was hired and he dumped the contaminated gravel onto the spent potlining pile. It was then shipped to Arlington mixed with several loads of spent potlining (B85343) on or about March 31, 1986. I became aware of the problem after the material had been delivered to Chem-Security Systems, Inc.

The oil in transformer VR-2A was tested and found to contain 16 ppm of PCB on 2/11/80 and 12 ppm of PCB on 1/24/86. A surface sample of gravel was tested in March 1985 and found to contain 19 ppm of PCB. In order to clean the area to less than 1 ppm of PCB, it was decided to remove the contaminated gravel from an area 15' by 20' by 1' deep which represents about 11 cubic yards (about 19 tons). Analysis of the soil in three locations after the contaminated material had been removed showed the following PCB results: 0.04 ppm, 0.26 ppm and 1.1 ppm. A copy of this analysis is attached. I would estimate that the contaminated material received by Arlington in the spent potlining had an average PCB content of about 10 ppm. On 4/17/86, a small load of PCB contaminated gravel removed from under the transformer where the level was 1.1 ppm was correctly shipped (manifest # 00174).

Should you have any questions, please contact me at 206-591-0416.

Sincerely,

Paul F. Schmeil

Paul F. Schmeil
Staff Environmental Engineer

Attachments
cc: John Baker Jack Schwegmann 1241 KB C. Brown 828 KB

TACOMA PLANT
3400 TAYLOR WAY, TACOMA, WASHINGTON 98421 PHONE (206) 383-1461

PCB LEAK CLEANUP PLAN

KAISER ALUMINUM & CHEMICAL CORPORATION

TACOMA, WASHINGTON FACILITY

By

Landau Associates, Inc.
Edmonds, Washington

26 January 1987

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INTRODUCTION

This plan outlines completed and proposed activities taken at the Kaiser Aluminum and Chemical Corporation (Kaiser) facility in Tacoma, Washington, in response to a recent leak of transformer oil containing low concentrations of PCB. The plant is located in the Tacoma tideflats industrial area near the base of the manmade peninsula that separates the Hylebos and Blair Waterways. The leak occurred in the rectifier yard located in the south-central portion of the plant. This plan includes a description of events leading up to and following the leak, a soil sampling and action plan, and a ground water monitoring plan.

Many factors must be taken into consideration when designing a sampling and analysis plan for cleanup of leaked materials. These considerations include the quantity of leaked material, the concentration of contaminants in the leaked material, the potential for offsite migration of the contaminants, and the potential for human contact with the contaminants. This plan reflects the relatively low concentrations of PCBs in the leaked oil, the high retardation rates associated with PCB that reduce its mobility in ground water, and restricted public access to the leak site. The plan is also responsive to existing PCB cleanup policies and approaches by the Washington Department of Ecology (WDOE) as communicated during ongoing coordination with Kaiser (1986) and the U.S. Environmental Protection Agency (EPA 1986).

SEQUENCE OF EVENTS

On Friday, 19 December 1986, at approximately 11:00 AM, it was conclusively determined that a significant amount of transformer fluid had been lost during Kaiser's attempts to refill Transformer 13 during reinstallation after maintenance. Initial checking indicated that perhaps as much as 3000 gallons of transformer fluid, containing between 10 and 15 parts per million (ppm) PCB, were lost after attempting to pump the transformer fluid from a storage tank via an underground line to Transformer 13. An inspection of a nearby basement sump system revealed that some oil was collecting on the surface of two of the three sumps and in some associated drainage troughs. Pumps evacuating the two contaminated sumps were shut down at approximately 10:00 AM. The third sump appeared to be clear and was allowed to continue discharging to the storm sewer.

Visual observations were made, and samples were taken, at various points in the plant storm sewer system to determine whether any oil had been discharged to the settling pond.

At 1:35 PM, Mr. David Davies of WDOE was notified of the spill and activities underway. Mr. Davies arrived at 4:00 PM and toured the rectifier yard and basement areas involved in the spill.

At 3:00 PM, a pressure test of a buried transfer line revealed that it was indeed cracked at a "riser" near the VR2A transformer. This riser was located approximately 40 feet from the basement sumps initially showing oil contamination.

Later that day, Kaiser contracted with General Electric for assistance in controlling leaked materials. Pumping of the two

contaminated sumps into storage drums was begun at approximately 6:00 PM. The "clean" sump continued to discharge to the storm sewer. Samples were taken from this clean sump twice daily to assure that oil contamination did not occur. The source of water to this sump can not be determined from existing drawings.

At 8:30 PM, Ms. Anita Frankel of the EPA, Region X, was contacted. The WDOE had already reported the spill to the EPA. The National Spill Response Center was notified on 23 December 1986.

A reconstruction of events as now understood is summarized as follows:

1. In April 1986, a contractor was used to remove and replace contaminated gravel near the VR2A transformer. Damage to a riser pipe on the transformer fluid transfer system may have occurred during this operation. The transfer system was not subsequently used until maintenance work on Transformer 13 was undertaken.

2. On 21 October 1986, approximately 3000 gallons of transformer fluid (10-15 ppm PCB) was pumped from Transformer 13 to a storage tank approximately 200 feet away. No measurement of transformer fluid was taken at either the transformer or storage tank after this transfer was completed. Transformer 13 was removed from the plant for maintenance.

3. On 11 December 1986, Transformer 13 was reinstalled. Between approximately 7:00 PM and 11:00 PM, the transformer fluid was pumped from the storage tank back to the transformer. It is likely that all or most of the leakage of

PCB-containing fluid occurred at this time, rather than during the October transfer. Oil was initially observed in nearby sumps and drainage troughs only 8 days after this transfer. This indicated time for leaked oil to travel to the sumps is reasonable in consideration of (a) the proximity of the leak site (40 feet) to the sump well and troughs; (b) soil and drainage conditions near the leak site; (c) the effects of sump pumping; and (d) the orientation of the leak opening in the riser toward the basement wall. The "fill" indicator on the transformer was not triggered at the time of this transfer; however, this was not considered abnormal since some fluid may have remained in the unit at the time it was transported for offsite maintenance and may have been removed for use in another unit by the maintenance contractor. Plans were to "top-off" the unit later.

4. On 12 December 1986, an additional 605 gallons of PCB-free transformer fluid were pumped through the system to Transformer 13. Still the unit did not "top-off".

5. On 18 December 1986, an additional 550 gallons of PCB-free transformer fluid were pumped through the system. When this also failed to "top-off" the system, the area supervisor was contacted and began the investigation that culminated in the conclusion that a loss of fluid had occurred.

Subsequent analysis concluded that approximately 2896 gallons of transformer fluid was leaked (Kaiser 1986). The

maximum PCB level in the leaked fluid is in the 10-15 ppm range; it is anticipated that some of the leaked fluid was PCB-free.

Pumping of the contaminated sumps into drums continued around the clock until 26 December 1986. At 9:00 AM, the third and highest flowing sump became visually contaminated. At this point, discharge to the storm sewer from this sump also was stopped. An immediate survey was taken of the storm sewer manholes, pump stations, and both surface ponds to verify that no oil had been inadvertently discharged to the storm system. None was identified, and subsequent samples at key points indicate that no identifiable contamination occurred.

Because of the high flow of the third sump, discharge to barrels became impractical. Northwest Enviroservices was contracted to supply tankers and personnel to continuously pump all sumps and remove the oil/water mix for proper disposal. Alternative methods of handling were investigated. A design for an oil/water separator was developed, and a plan to discharge resulting "treated" water to the Tacoma Sewage Utility was devised and implemented.

The separator began receiving sump discharge on 31 December 1986, at 10:30 PM. Northwest Enviroservices continued to handle the "treated" water until PCB levels within the product from the system could be determined and a discharge permit could be obtained from the sewage utility. On 6 January 1987, at 2:30 PM, the discharge permit was approved. Approximately 8500 gallons per day has been discharged to the sanitary system since that time. Oil being reclaimed is still being held in the separator.

PCB levels in the "treated" water have been at or below the level of detection of 0.1 parts per billion (ppb).

Approximately 150,000 gallons of oil/water was handled by Northwest Enviroservices. Approximately 750 gallons of oil was separated by their facility. Approximately 100 drums of oil/water mix (oil content unknown) remains in drums in Line 5. Oil is currently being reclaimed by the separator at a very low (as yet undetermined) rate.

REMEDIAL ACTION TAKEN TO DATE

Site containment/cleanup activities undertaken thus far are as follows:

1. Two sumps have been installed to below the ground water level. One is near the BPA fence, approximately 40 feet directly south of the leak site. The second is at the leak site. Significant oil is visible in the sump at the leak site. Weekly sampling of this sump has been conducted. No oil has been detected at the sump near the fence.
2. An attempt to install a "cut-off" trench proved not to be feasible because of the soil conditions and the significant interference by plant underground and overhead utilities.
3. Basement sump pumping is automated and routed to the oil/water separator, which discharges treated water to the sanitary system.
4. The oil transfer system which leaked has been abandoned permanently. Future oil transfers will be made by using above-ground flexible lines.

5. Access to the site has been further restricted to a "need only" basis. It should be noted that this leak occurred in an area that has always been "limited access", even to plant personnel, because of the inherent electrical dangers.

6. Soil removed during construction of the sump at the leak site was transported to the Arlington, Oregon waste disposal site.

While the WDOE has been involved and informed regarding day-to-day activities, the purpose of this report is to present, for WDOE approval, a final plan outlining additional investigative and remedial actions designed to control environmental risks associated with this leak.

GROUND WATER

GROUND WATER CONDITIONS

Previous investigations (Dames & Moore, 1985) have confirmed the existence of shallow, intermediate, and deep water-bearing zones within 50 feet of the ground surface and a deep confined production aquifer encountered at depths of 600 feet or more. Long-term monitoring (1981-1987) of ground water quality in the three near-surface water-bearing zones indicate that contamination associated with past practices at the site (cyanide, fluoride, PAHs) is limited to the shallow and intermediate zones.

Well locations and ground water elevation contours developed for the wet scrubber sludge management area and spent potlining management facility closure are shown on Figures 1 through 5. These data indicate that seasonal variations in ground water flow

direction and velocity occur in the shallow and intermediate water-bearing zones underlying the plant site.

The shallow water-bearing zone shows the strongest seasonal level variation. Between July and November observations, water levels in the shallow water-bearing zone increased and the northwest trending divide near wells L and AA shifted to the southwest (Figures 2 and 4). Contours indicate that the shallow water-bearing zone is influenced by drainage towards the Hylebos waterway and the Kaiser ditch and by the pre-fill drainage surface (Bortleson, et. al. 1980).

Ground water data for the plant indicate that the leak site is at or slightly to the northeast of the time average ground water divide between the Hylebos and Blair Waterways. Therefore, ground water flow beneath the leak site could be towards either waterway. However, local ground water flow in the shallow water-bearing zone is primarily affected by the pumping of nearby basement sumps to the west and northwest of the leak site. This is illustrated by Figure 6, which shows the relative ground water levels in the sumps and in wells G and J, the closest monitoring wells to the leak site.

GROUND WATER MONITORING PROGRAM

Selected wells in the existing ground water monitoring system at the Kaiser plant (G, J, and K) will be used to monitor ground water levels and quality (Figure 7). In addition, two new well clusters (each comprised of a shallow and intermediate well) will be installed to monitor ground water flow and quality in the vicinity of the spill.

One new well cluster will be placed to the south of the leak site (on adjacent Bonneville Power Administration (BPA) property) and one to the north of the rectifier building (Figure 7). Four-inch inside diameter (ID) PVC casings will be used for the wells to facilitate sampling and permit future cleanup/recovery programs (if necessary). The proposed well design for the 4-inch diameter wells is presented on Figure 8.

All new wells in the monitoring system will be sampled for PCBs upon completion and development. Water levels will also be measured immediately after well completion and at quarterly intervals to supplement the current understanding of ground water flow direction and rates in the shallow and intermediate water-bearing zones.

The two new well clusters will be sampled quarterly for PCB for one year. Wells G, J, and K will be sampled semi-annually, and other selected wells in the monitoring system may be sampled for PCB as appropriate based on observed conditions or monitoring results. Ground water in the sump near the BPA fence will be observed weekly for the presence of oil. Ground water sample collection and handling procedures are presented in Appendix A. Quality assurance/quality control (QA/QC) procedures are presented in Appendix B.

If concentrations of PCBs are detected in ground water in excess of 1 ppb at the new wells, the WDOE will be notified and a new action plan will be developed. Additional activities could include additional monitoring or withdrawal wells which would supplement ongoing PCB removal.

Drums containing an oil/water mix that are currently stored along Line 5 will be transported to Northwest Enviroservices for appropriate disposition.

SOIL

SOIL CONDITIONS

PCB concentrations in the leaked oil range from 10 to 15 ppm (Kaiser 1986). The leak occurred in near-surface soil which, based on data from previous investigations (Dames & Moore, 1985), is comprised of loose, silty fine-to-coarse sand. This soil material has a typical in-place dry density of approximately 100 pounds per cubic foot (Hough, 1957); the resulting porosity of the soil is approximately 40 percent by volume. Assuming that the leaked oil (with a specific gravity of 0.87) occupies 100 percent of the voids, the resulting maximum concentration of PCB in the soil matrix would range from 1.8 to 2.7 ppm (Table 1). Actual PCB concentrations in soil should be significantly less (except in the immediate vicinity of the leak) due to: (1) less than saturated conditions existing above the water table in the shallow water-bearing zone, and (2) the presence of ground water in soil both above and below the water table, reducing the void space available for PCB-contaminated soil.

SOIL SAMPLE LOCATIONS

Sampling will be conducted within a circular area to standardize sample design and layout in the field and to ensure that the sampling extends into areas not contaminated by the leak. The center of the circle will be the point of the leak.

Sampling points will be staked out in a 20-foot radius using a hexagonal grid with 10-foot sample point spacing. Sampling points that land in impervious areas (e.g. buildings, concrete foundations) will be moved to the nearest location within 5 feet where soil can be collected. If no feasible soil sampling site exists within 5 feet of the initial sample location, the sampling point will be omitted. Approximate sample locations are shown in Figure 9. A total of 16 locations will be sampled using the following method:

1. Samples of the surface soil will be collected using a post-hole digger at a depth of 0.5 feet at each site identified on Figure 9. Soil samples will be labeled and transported to the laboratory in a cooler.
2. A detection limit of 1 ppm PCB will be established. If analysis results are below the detection limit, no action will be taken. If PCBs are detected within a grid segment, another soil sample will be taken at 1.5 feet and the soil within that segment will be removed to a depth of 1 foot and replaced with clean soil.
3. If analysis of soil collected at 1.5 feet shows concentrations of PCB to be greater than 1 ppm, the WDOE will be notified and a notice will be included in the deed concerning the presence and location of elevated PCB concentrations.

SOIL SAMPLE ANALYSIS

The sampling scheme will result in the submittal of at least 16 soil samples for analysis. Because it is important to obtain

certifiable results in defining concentrations and extent of the spill, U.S. EPA-approved methods for PCB analysis (EPA Method 8080), reported on a dry-weight basis, will be performed on the samples. Results will be calibrated against a best-fit Aroclor standard. If additional analyses are required to further define areas of contamination or concentration gradients, less expensive and more rapid screening methods will be used. Quality control samples will consist of the following:

- A field blank, consisting of a surface wipe from the sampling equipment after decontamination between sample collection, placed in a blank sample jar.
- Duplicate sample prepared in the field.
- A laboratory method blank that accompanies sample analysis.
- A laboratory replicate analysis.
- A laboratory spike analysis that accompanies sample analysis.

Additional QA/QC procedures for soil sampling and collection are presented in Appendix B.

SUMMARY OF REMEDIAL ACTION

The following actions will be undertaken by Kaiser to detect, analyze, and control the movement of leaked transformer oil containing PCBs at the Kaiser facility rectifier yard.

- Two new well clusters will be established at locations north and south of the transformer oil leak. Two wells will be located at each cluster; one will be screened in the shallow

water-bearing zone and one will be screened in the intermediate water-bearing zone at each location. Ground water samples will be collected quarterly and tested for PCBs. Semi-annual sampling will also be conducted at existing monitoring wells G, J, and K and analyzed for PCBs. If PCB concentrations in ground water exceed 1 ppb, Kaiser will notify WDOE and a new action plan will be developed.

- Oil will be periodically skimmed from the leak site sump and collected in the oil/water separator for future transport to Northwest Enviroservices for appropriate handling.
- The sump near the BPA fence will be observed weekly for the presence of oil and sampled monthly.
- The approximately 100 drums containing an oil/water mix currently stored in Line 5 will be transported to Northwest Enviroservices for appropriate handling.
- Soil samples will be collected at a depth of 0.5 feet at established grid points within 20 feet of the leak site. Where PCB concentrations in soil samples exceed the established detection limit of 1 ppm, an additional soil sample will be collected at a depth of 1.5 feet. If concentrations in the lower sample exceed the detection limit, this information will be noted in the deed. All soil to a depth of 1 foot will be removed and replaced with clean fill at grid sections where PCB detection limits are exceeded in soil. All removed materials will be transported to an approved disposal site.

REPORT

After receipt of soil sampling data from the laboratory, a sampling and analysis report will be prepared that includes a map of the sampling points, sampling methods and notes, laboratory data, quality control results, and discussion of results and recommendations regarding further data collection and cleanup activities.

HGL/BFB/SAJ:sg
No. 18-06.03
26 January 1987

Kaiser-Tacoma SEDIMENT SAMPLES IN "KAISER" DITCH 02-Jan-90

		#6 Below Outfall	#7 Down-stream Outfall	Duplicate #7 Downstream Outfall
ORGANIC ACID AND BASE-NEUTRAL COMPOUNDS				
4-Mehtylphenol	ug/kg	110	ND	
Phenanthrene	ug/kg	750	5500	
Anthracene	ug/kg	130	ND	
Fluoranthene	ug/kg	3300	12000	
Pyrene	ug/kg	3400	11000	
Benzo(a)Anthracene	ug/kg	1400	2500	
Chrysene	ug/kg	5000	6600	
Bis(2-Ethylhexyl)Phthalate	ug/kg	930	1600	
Benzo(b)Fluoranthene	ug/kg	3000	3200	
Benzo(k)Fluoranthene	ug/kg	1300	2000	
Benzo(a)Pyrene	ug/kg	650	ND	
Indeno(1,2,3-cd)Pyrene	ug/kg	440	ND	
Dibenzo(a,h)Anthracene	ug/kg	210	ND	
Benzo((g,h,i)Perylene	ug/kg	550	ND	
PECTICIDES - NONE DETECTED				
POLYCHLORINATED BIPHENYLS				
PCB, A-1248	ug/kg	ND	1800	
PCB, A-1260	ug/kg	345	ND	
LATILE ORGANIC COMPOUNDS				
Acetone	ug/kg	ND	54.5	
Methylene Chloride	ug/kg	41.7	40.0	
Chloroform	ug/kg	5	5.5	
METALS				
Arsenic	ug/g	58	65	67
Antimony	ug/g	5.3	4.0	6.6
Barium	ug/g	Not analyzed		
Beryllium	ug/g	0.80	0.80	0.70
Cadmium	ug/g	<0.200	<0.200	<0.200
Chromium	ug/g	47	38	41
Copper	ug/g	140	130	120
Mercury	ug/g	0.040	0.020	0.018
Nickel	ug/g	46	34	33
Lead	ug/g	72	56	56
Selenium	ug/g	0.300	<0.28	<0.28
Silver	ug/g	<1.0	<1.0	<1.0
Thallium	ug/g	5.8	1.00	0.90
Zinc	ug/g	190	240	220
Aluminum	ug/g	24000	21000	21000
CYANIDE	ug/g	<0.6	<0.6	
THER				
Fluoride	ug/g	20.4	15.3	
Phenol	ug/g	1.17	<0.8	

NOTE: Compounds Below Detection Limit are NOT Listed

S1. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

I. LIMITS AND MONITORING

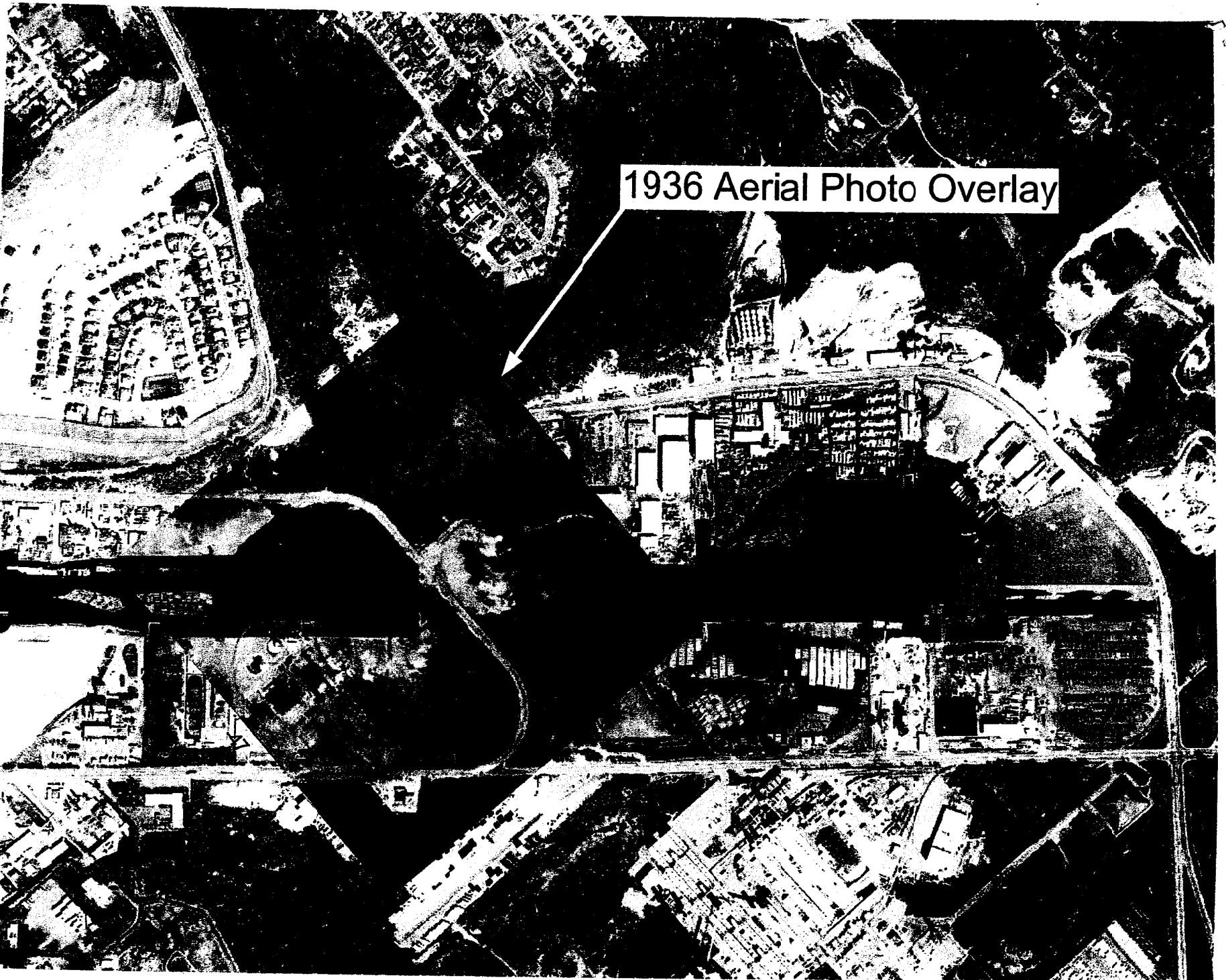
A. Outfall 001: Industrial Wastewater Discharge from Settling Basin to Hylebos Waterway (a)

From the issuance date of this permit, the Permittee is authorized to discharge from outfall No. 001, subject to the following limitations and conditions:

Parameter	Effluent Limits Monthly Average	Effluent Limits Daily Maximum	Monitoring Requirements Frequency	Monitoring Requirements Sample Type
Total Suspended Solids (TSS)	160.0 lbs/day	320.0 lbs/day	Daily	Composite
Fluoride	80.0 lbs/day	240.0 lbs/day	Daily	Composite
Aluminum	25.0 lbs/day	50.0 lbs/day	Daily	Composite
Oil & Grease		10.0 mg/l	Daily	Grab
Benzo(a)pyrene (a)		0.01 mg/l	Weekly	Composite
Cyanide, Free (b)		0.01 mg/l	Weekly *	Composite
PCBs, Total (c)		0.003 mg/l	Quarterly	Grab
Nickel		0.01 mg/l	Weekly *	Composite
Copper (d)			Weekly *	Composite
pH (e)	6.0 to 9.0 at all times		Continuous	Continuous
Temperature °F			Continuous	Continuous
Flow, MGD			Continuous	Continuous
Precipitation, inches as rain (f)			Daily	24-hour
Aluminum Metal Production, tons/day				Daily Average

Discharge and Monitoring Definitions and Explanations

- The monthly average is defined as the sum of all daily discharges divided by the number of daily discharges measured during the calendar month.
- The daily maximum is defined as the highest allowable daily discharge during the calendar month.
- Composite is defined as a 24-hour or 72-hour flow or time proportional sample, whichever is most representative of the discharge.
- Daily composite monitoring is defined as four (4) 24-hour composite samples and one (1) 72-hour composite sample per week; daily grab monitoring is defined as five (5) days per week; weekly monitoring is defined as one (1) day per week; quarterly monitoring is defined as four (4) days evenly spaced out per year, i.e., approximately once every ninety (90) days; and daily precipitation monitoring is defined as seven (7) days per week.


1936 Aerial Photo Overlay